



Crawford, Elaine Rosemary (2017) Advancing education for sustainable development in the curriculum in Scotland's colleges: an analysis. PhD thesis.

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**Advancing Education for Sustainable Development in the  
Curriculum in Scotland's Colleges - An Analysis**

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**Submitted in fulfilment of the requirements for the Degree of  
Doctor of Philosophy**

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**April 2016**

## Abstract

Education is seen to have a central role in the transition towards a sustainable future. Education for sustainable development (ESD) has been heralded by the United Nations Decade of Education for Sustainable Development as a tool for achieving global sustainability. The Scottish Government also advocates ESD as the means to providing society with the knowledge, skills, values and attitudes to live more sustainable lives. Whilst considerable progress has been made in Scotland's schools, particularly primary schools, and to a lesser degree in university education, there has been limited evidence of the same success in Scotland's colleges. There has been limited widespread investigation or published work on the advances of ESD in the Scottish college curriculum.

This research aimed to explore if an ESD Practitioner could enhance the ESD landscape in Scotland's colleges by producing learning and teaching materials for curriculum development that could be used by both staff and students. The research also planned to investigate the ESD backdrop in Scotland's colleges, against which the intervention of curriculum development was set. To explore this, a survey was issued to all Scottish College Principals to determine their opinions of ESD at a senior management level. The survey also asked about the use of the learning and teaching materials within their college. Three colleges were then utilised as case studies to evaluate the use of the learning and teaching materials, within the curriculum, with staff and students.

During the research period, the Scottish college sector underwent a major restructuring of college mergers, making this the most volatile period in Scottish college history. These changes impacted upon the research, frequently restricting the research process. Nonetheless, the research established that ESD development in Scotland's colleges still requires significant work. Moreover, whilst the learning and teaching materials were found to have a modest impact upon the sustainability ethos of those who engaged with them, (particularly upon the students), it was established that effective ESD requires a multi-faceted approach to be successful. Curriculum development on its own will not achieve the step-change that is required for a future thinking society faced with the environmental challenges that are the result of a growing consumerist population, anthropogenic climate change and increasing social injustice. To meet these challenges in Scotland's colleges, curriculum development must be linked to effective policy, management and drive, as well as campus management, and the recognition of all interested parties and stakeholders as co-constructors of ESD development. Not only is

senior management support vital, there also needs to be a recognised sustainability staff member or group, or an ESD Practitioner, helping to drive the ESD agenda forward. Only then will Scotland's colleges be effective in producing the sustainability focused society that is required.

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## Acknowledgement

I am deeply grateful to many people who have helped me through this long, and at times, difficult process. First, is my supervisor Doctor Bethan Wood, not only for guiding me through this thesis, but an undergraduate degree and Masters also. More importantly, it was Bethan's belief in me that inspired me to undertake this research. Thank you also to my supervisor Professor Bob Davis, not only for his support and guidance producing this thesis, but also for helping me begin to understand the language of the social scientist, which was largely a foreign language to me at the beginning of the process.

I would also like to thank the Colleges who took the time to respond to my survey, especially because the Scottish College sector was undergoing a period of enormous stress at the time as a result of the merger process. A special thanks must be given to the case study colleges for allowing me access to their staff and students to trial the teaching materials I had developed. I will be forever grateful to the college staff and students who gave me their time and their feedback, especially the 'sustainability champions' I have had the pleasure of working with.

Next I need to thank other supportive colleagues I have worked with over the years. First, at the college where I am employed, you know who you are, and secondly at the University of Glasgow. Also, staff at other organisations that have helped me: The Environmental Association for Universities and Colleges; Colleges Scotland and College Development Network; and the Scottish Funding Council.

Finally, thank you to my family, Sandy, Matthew and Rebecca. It has been a challenging few years, and I couldn't have completed this without your support.

## Author's Declaration

I declare that except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

Signature \_\_\_\_\_

Printed name \_\_\_\_\_

## Chapter One: Introduction

### Chapter Purposes

- To provide an outline of the thesis topic.
- To explain the importance of the research topic.
- To introduce the research theme and rationale.
- To make clear my interest in the research topic.

### Introduction

Human concern for the natural environment – by which I mean the biosphere and all it contains – or the Earth in general can exist for a number of reasons such as the use of limited resources, the loss of species or anthropogenic climate change. Oftentimes these reasons are considered from an ‘anthropocentric’ viewpoint of current and future difficulty for human life, rather than concern about how human activities’ are degrading the biosphere itself (Norton, 2005). Whether concern for human-related values or the environment itself, these issues include, but are not limited to the following:

- Environmental problems threaten people’s health, livelihoods and lives and can cause wars and threaten future generations (Hopwood *et al.*, 2005, p39).
- Humanity faces a world of far-reaching anthropogenic-induced environmental problems, in an order of magnitude unprecedented in human history. The state of the environment has significant implications for the well-being of humans and other species on earth, which is currently seriously threatened. In addition, humanity faces several important societal problems as well, such as failing socio-economic and institutional systems (Waas *et al.*, 2010, p629).
- Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development (IPCC, 2014, p13).

Owing to concerns such as these, sustainable development has increasingly come to the fore in recent years. This is clear, even to the extent where the political attitude of the once sceptical United States of America may be changing to acknowledge anthropogenic climate change as a global issue, a shift which was evident at the United Nations Conference on Climate Change 2015 (COP 21) where President Obama stated that climate

change is ‘an economic and security imperative that we have to tackle now’ (CBS News, 2015).

Education for sustainable development (ESD) aims to raise awareness of, and offer solutions to, anthropogenic climate change as well as addressing other issues such as population growth, the use of limited resources and social inequality. My research aims to address key features of this *environmental crisis* as well as inspecting the background and development of ESD in Scotland, along with what has helped to shape educational policy for ESD. I will evaluate Scotland’s Colleges to establish where ESD theory, practice and delivery are currently integrated into their thinking and practice. Finally, I will try to determine if my methodology is appropriate to embed ESD in the curriculum of these institutions by assessing learning and teaching materials I have developed and which are used in some of the colleges.

Throughout the research period I have also been employed in the Scottish college sector, part-time at one college as their Sustainable Development Adviser initially and subsequently as their Climate Change Officer, and also at a national level as part of a Scottish Funding Council (SFC) project to embed ESD in the Scottish college curriculum. This access has enabled me to conduct the research as a practitioner in the field of ESD. Furthermore, it means my research and employment are interconnected with one constantly informing the other and vice versa.

## **Overview of the Research**

The central themes of this research are twofold: first to determine if my approaches as an ESD practitioner have impacted curriculum ESD progression in areas I can influence; and secondly, to determine the extent that ESD is being considered in college education in Scotland at a national strategic level, and also how senior managers’ opinions of ESD translate into practice at college level. I will aim to determine the extent to which I have impacted the progression of ESD within Scotland’s Colleges as a result of the work I was employed to do in the Scottish college sector. In order to achieve these ends, first the *environmental crisis* needs to be interrogated to establish the challenges that need to be overcome in order to effectively include ESD in learning and teaching. The progression of ESD, predominantly within further education (FE) in Scotland, will also be investigated to assess current policy and also to establish where theory, practice and delivery are integrated. The barriers to embedding ESD within the curriculum will also be determined

and I will suggest a number of methods that can be employed to remove some of these barriers. This will be established by examining the opinions of staff and students of the learning and teaching materials I have developed in order to consider their effectiveness in overcoming some of the obstacles that exist to embedding ESD in the curriculum.

At the college where I am currently employed, my main remit initially was to embed ESD within the curriculum. This is largely when the ESD learning and teaching materials were developed. My role in this college has recently changed to Climate Change Officer where I am responsible for the college's climate change commitment plan as part of the Estates Team. The other project that employed me throughout the research period provided me with access to all of Scotland's Colleges that elected to interact with the ESD Scottish College Project. Both of these roles hence gave me the means and opportunities to engage with college staff and students more broadly to investigate and facilitate the progress of ESD in Scotland's Colleges.

### **The Environmental Question**

The urgent requirement for ESD could be partly attributed to concern over environmental issues which appear to be worsening with each passing year. This concern is fuelled by the media with headlines such as 'Though climate change is a crisis, the population threat is even worse' (Emmott, 2015) and 'Malawi's battle to hold onto forests' (Harrabin, 2015). Even more recently, *The Guardian* reported in December 2015 that floods in Cumbria were attributable to 'Storm Desmond rainfall partly due to climate change, scientists conclude' (Vidal, 2015). To effectively address these environmental concerns, we need to move beyond journalistic attention-grabbing headlines. It is becoming increasingly apparent that there are genuine and serious environmental issues that humans need to address such as anthropogenic climate change, population growth, the use of finite resources, loss of biodiversity and global inequality, to name but a few. These points form the basis of the *environmental crisis* we are facing and from which the *environmental question* arises. Scientific consensus on the issues humanity faces as a result of this crisis, and questions arising as a consequence of this will be appraised in the following chapters. These concerns, and the ways in which they are approached in the college curriculum in Scotland, form the core of the *environmental question* in relation to this research. The conceptual umbrella under which these themes are analysed is Education for Sustainable Development (ESD), which can be broadly understood in the following terms:

ESD empowers learners to take informed decision and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity. It is about lifelong learning, and is an integral part of quality education. ESD is holistic and transformational education which addresses learning content and outcomes, pedagogy and the learning environment. It achieves its purpose by transforming society (UNESCO, 2014, p12).

### **Sustainable Development and Education for Sustainable Development**

The first challenge is to attempt to define what sustainable development and ESD are. This then exposes some of the difficulties which attend any effort to encompass all notions of ESD as well as the problems associated with understanding complex terminology in the area. Applied to education, ESD tackles such a wide range of differing concerns, from climate change to loss of biodiversity to social inequality, that the educational task can become a very complex one.

Defining sustainable development is already a demanding task. However, the most commonly used stipulative definition from *Our Common Future* by the World Commission on Environment and Development (WCED), otherwise known as the Brundtland Report, is ‘sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (WCED, 1987, p43). The Brundtland Report was the first time that social, economic and ecological aspects of development were explicitly considered together (Baker, 2006). The definition has hence developed and expanded since its origin and now sustainable development is commonly interpreted through the United Nations (UN) definition – from the World Summit in 2005 – which affirmed the concept of the three pillars of sustainability. The three pillars are *economic*, *social* and *environmental*, whereby each pillar needs to be given equal consideration with the accompanying recognition that they are interconnected, overlapping and interdependent (United Nations, 2005). Some have argued that the WCED definition is ‘essentially anthropocentric’ (Seghezzo, 2009, p542) and the UN model outdated as ‘the suitability of this paradigm to explain and solve environmental, social, and economic problems needs to be reconsidered’ (Seghezzo, 2009, p540). I appreciate that there are dissenters who are dissatisfied with these definitions and who insist they are ‘in line with the notion of ‘weak’ sustainability which allows a trade-off between ‘natural’ and ‘man-made’ capital’ (Seghezzo, 2009, p542). In addition,

Dunlap (2006, p325) argues that ‘environmental concern should be founded on reasons of a more spiritual nature’. These objections place both Seghezze and Dunlap at odds with the beliefs of the UN and the WCED. However, I will stand by the WCED definition and UN model to set the scene and provide the backdrop for this research, because I believe it is against this literature that the Scottish Government produced its ESD aspirations, which is evident in key documents such as *Learning for our Future* (2006) and *Learning for Change* (2010), both produced in response to the United Nations Decade of Education for Sustainable Development (UNDESD). Further evidence that the Scottish Government takes guidance from the UN to implement its ESD strategy was the establishment of the United Nations University (UNU) Scottish Regional Centre of Expertise, in the University of Edinburgh, and known as Learning for Sustainability Scotland, which is endorsed by the Scottish Government.

The term ‘sustainable development’ in relation to ESD has been scrutinised extensively over recent years resulting in many overlapping interpretations providing sometimes contrasting responses to the Brundtland definition, such as:

- sustainable development is an unashamedly anthropocentric concept (Lee, 2000, p32), or
- sustainable development should include deep green values where natural systems and biodiversity have rights and values themselves (Naess, 1989) and,
- sustainable development should not promote continuous economic growth as ecosystems and natural resources are finite (Daly, 1993).

My research is predicated on the view that where sustainable development is successful this will enable *sustainability* to be realised. Moreover, to achieve sustainable development and therefore accomplish sustainability, successful ESD is essential (Scott & Gough, 2003). In order to move towards sustainability, public awareness, education and training are required, and these principles constitute a cornerstone of this research. Whilst it is widely accepted that reorienting education towards sustainable development is one of the key drivers for moving society towards global sustainability (Fien & Tilbury, 2002; Hopkins & McKeown, 2002), the difficulty in defining sustainable development and whether it is achievable or not, continues to hamper progress.

Different cultures have different visions of what a sustainable community will look like and how it will function and ‘many communities are struggling with their development in



an increasingly interconnected global world' (Dale & Newman, 2010, p5). Some of the difficulties in establishing sustainable communities are that 'many modern issues are beyond the capacity of any one community or sector to solve' and 'the failure to implement sustainable development is primarily a social issue, resulting from our failure to learn from our boom and bust cycles of development' (Dale & Newman, 2010, p6). The lack of agreed definitions of, and vision for, both sustainable development and sustainable communities has made efforts to implement ESD very challenging. Defining sustainable development effectively is crucial to its implementation. So also is clearly differentiating between sustainable development and sustainability, since often the terms are used interchangeably (Scott & Gough, 2003). However, literature endorses the view which this research will also adopt – that sustainable development is the *process for change* – whereas sustainability is a goal that sustainable development hopes to achieve (Scott & Gough, 2003).

*Our Common Future* extensively comments that teachers have a crucial role to play in encouraging the extensive social changes necessary for sustainable development (WCED, 1987). However, the concept of using education to achieve sustainability through a just and ecologically aware and balanced society was not a new idea even when this document was produced. Much earlier, Schumacher (1973) acknowledged that education represents the greatest resource at our disposal for attaining a paradigm shift to a sustainable way of life. This argument has subsequently been taken further: 'given that academics know about the current ecological condition of the planet, there is an obligation for universities to become leaders in the movement to prevent global ecological collapse' (Moore, 2005, p326). It is therefore unsurprising that the United Nations Educational, Scientific and Cultural Organization (UNESCO) recently described ESD as 'a process of learning how to make decisions that consider the long-term future of the economy, ecology and equity of all communities' (2013, p3). In order to achieve this end, UNESCO believes that 'building the capacity for such future-oriented action is a key task of education' (2013, p3). This strongly suggests that not only is education recognised as an important medium for achieving sustainability, it also has a moral obligation to ensure it does so.

After *Our Common Future*, the idea of sustainable development was further developed by the United Nations Conference on Environment and Development in Rio de Janeiro (1992). It was here that the vital role education should play in the quest for sustainable development was fully highlighted, in Chapter 36 of *Agenda 21* (UNDESA, 1992). *Agenda 21* identified four major components of ESD, which are: to improve basic

education; reorient existing education to address sustainable development; develop public understanding and awareness; and training. *Agenda 21* and the impact it had upon Scottish education will be investigated further in the next chapter.

As definitions of sustainable development, sustainable communities and what constitutes sustainable education continue to vary widely, it is no surprise that attempting to establish an agreed definition of ESD also still causes considerable academic debate, meaning essentially that it remains a contested phrase (Jones *et al.*, 2008). One definition is that ESD should be explained as ‘coping with’ rather than conclusively ‘solving the ecological crisis’ (Barry, 2007, p442). However, this position implies that humans should adapt to the consequences of the ecological crisis we are facing because it is inevitable, rather than changing behaviour to lessen our impact and avoid ecological crises. ESD has many definitions, but my research fundamentally adheres to the view that ‘sustainable development education is the process of acquiring the knowledge, skills and attitudes needed to build local and global societies that are just, equitable and living within the environmental limits of our planet, both now and in the future’ (Learning and Skills Council, 2008, p7).

As has been established, definitional conflict about all aspects of sustainable development and sustainability is nothing new and conflict still exists. Furthermore, sustainable development appears to ‘bring into harmony two politically attractive but potentially conflicting notions’ which are difficult to reconcile (Bonnett, 1999, p313). Bonnett (2002) expands this point by:

sustainable development conceived as a policy, while in some ways a highly attractive notion in that it promises to meld aspirations for an improved standard of living with the perceived need for conservation, is also a highly problematic notion which is open to a range of interpretations, subversions and internal contradictions as well as raising severe epistemological problems (p12).

Bonnett’s major point here is that educational aspirations to promote sustainability need to marry practicalities of life with human consciousness of nature, to ensure aspects of the formal taught curriculum are related to the ethos and practice of the educational institution (2002, p19). Therefore, curriculum reform is required, but just as importantly, sustainable practice needs to be holistically evident across schools, college and university campuses also.

UNESCO is a United Nations department which aims to ‘create holistic policies that are capable of addressing the social, environmental and economic dimensions of sustainable development’ (UNESCO, 2014). UNESCO explains ESD as:

The vision of education for sustainable development is a world where everyone has the opportunity to benefit from quality education and learn the values, behaviour and lifestyles required for a sustainable future and for positive societal transformation. ESD is a process of learning how to make decisions that consider the long-term futures of the economy, ecology, and the equitable development of all communities. The three pillars of sustainable development are economic, environment, and social. The founding value of ESD is respect: respect for others, respect in the present and for future generations, respect for the planet and what it provides to us (resources, fauna and flora) (2009, p1).

This is a consensus definition but I believe it can be used stipulatively and it is one that is consistent with my own ethos and the aims I wish to achieve with this research and the ESD work I practice. My stance can be vindicated by looking at each sentence individually.

**Sentence 1:**

*‘The vision of education for sustainable development is a world where everyone has the opportunity to benefit from quality education and learn the values, behaviour and lifestyles required for a sustainable future and for positive societal transformation’* (UNESCO, 2009, p1).

My research embraces this as I believe ESD should be embedded within all areas of the curriculum so that all students are taught ‘the values, behaviour and lifestyles required for a sustainable future’.

**Sentence 2:**

*‘ESD is a process of learning how to make decisions that consider the long-term futures of the economy, ecology, and the equitable development of all communities’* (UNESCO, 2009, p1).

My research aims to provide students with the knowledge and skills required so they can make informed decisions ‘about the long-term futures of the economy, ecology and the equitable development of all communities’. If students have relevant knowledge and skills, it is expected this will impact their sustainability values, however this research will not measure any long-term change in values.

**Sentence 3:**

*‘The three pillars of sustainable development are economic, environment, and social’* (UNESCO, 2009, p1).

All work I undertake with staff and students begins with the three pillars of sustainable development and an explanation of why they need to be considered as equally important and in conjunction to ensure sustainability is achieved.

**Sentence 4:**

*‘The founding value of ESD is respect: respect for others, respect in the present and for future generations, respect for the planet and what it provides to us (resources, fauna and flora)’* (UNESCO, 2009, p1).

My research aims to highlight the need to think of others both now and in the future and to show how finite resources impact our consumerist Western lifestyles often at the expense of others, whether this be in terms of intragenerational or intergenerational equity and regard for other species. My research aims to address all of the above points by utilising learning and teaching materials I have developed and the approaches I use for staff ESD training.

Recent UN declarations are underpinned by long-held beliefs and to help UNESCO achieve their ‘vision’ of a sustainable world, the UN implemented a Decade of Education for Sustainable Development (DESD) from 2005 to 2014. The United Nations Decade of Education for Sustainable Development was a global initiative that recognised the vital role that education had to play in the transition to achieve societal change that would motivate all generations to develop a sustainable future (UNESCO, 2004). The overarching goal of the DESD was to ‘integrate the principles, values and practices of sustainable development into all aspects of education and learning, and all areas of life

including communities, the workplace and society in general' (UNESCO, 2004, p6). The DESD also identified the importance of governments in their commitment to changing education in order to ensure sustainable development would be embedded into educational strategies and the curriculum (Tilbury, 2011, p12). As my research was conducted as the end of the UNDESD approached, it was well placed to measure the influence the UNDESD had on college education in Scotland.

ESD has been used as an encompassing term to mean *sustainable development education*, which is commonly used in Scotland, and also *education about sustainability*, *education for sustainability*, and *sustainability education*, and all other similar terms. I have adopted this tactic because as explained by the Higher Education Academy, it would be expected for there to be a variety of approaches to ESD because of its interdisciplinary nature (Higher Education Academy, 2014). Further expanding on my earlier ESD ethos, I also believe that ESD is education that embraces living within the boundaries of one planet, considering finite resources, social responsibility and global citizenship, as well as raising awareness of environmental issues such as anthropogenic climate change and the negative environmental impacts that humans have upon the biosphere and all species within it.

ESD, just like sustainable development, spans a wide political spectrum, and can be far more radical than the approach I have adopted. At one end of the spectrum is the deep-seated green movement extolling the virtues of deep ecology and dark green environmental ethics. At the other extreme lie the die-hard geo-engineers and techno-fixers. However, resolutions from one end of the continuum to the other requires:

learning about creative solutions that could make economic prosperity and the conservation of nature a simultaneous possibility; of providing the knowledge needed to develop innovative, resource-saving techniques; of knowledge of new forms of political action in which the contribution of civil society is more highly valued; of reflecting on new lifestyles which combine well-being, contentment and respect for other people and nature; of taking up the viewpoints of people from other countries; of fair trade initiatives and new forms of worldwide cooperation (de Haans *et al.*, 2010, p200).

Whilst I am well aware of this spectrum and the wider ESD movements associated with it, the approach I have adopted is at the conservative end of the range. I am focusing on the political meaning and traction of ESD within Scottish FE because it needs to be

remembered that this is the backdrop my research is set within. My approach has largely been guided by UN educational policy because this is what informs Scottish government policy whilst these other more radical environmental actors do not. I acknowledge that the Scottish Government's view may be seen as restricted and open to criticism, however this is no different to the similar views of other industrialised countries because 'current work on ESD, both political and academic, is carried out within the framework of the United Nations Decade of Education of Sustainable Development' (de Haans *et al.*, 2010, p201). My own personal judgement of what needs to be accomplished by ESD is certainly more ambitious than that of the Scottish government – and I would certainly like to be more radical. However, I am constrained by the stakeholders that have engaged with me to proceed with ESD in Scotland's Colleges within the confines of the government's understanding of ESD. Had I assumed a more extremist, militant attitude, it is highly likely these stakeholders would not have been interested in my work and would not have approached me in the first instance. Moreover, I know from experience an activist approach tends to be counterproductive and alienates staff and students. As a result, my own research ESD philosophy has accordingly been moulded by the context in which I am immersed and my ESD definition is driven by the framework in which I am employed.

Building on my conservative approach, I believe that whilst the economy needs to be a central concern within sustainable development, I believe that economic development needs to be considered at local, regional and national levels, rather than just at a global level, in relation to local communities and individual country states in a manner which is appropriate for that community. This is essential because 'sustainable development is a dynamic and evolving concept with many dimensions and interpretations that reflect locally relevant and culturally appropriate visions' (Pigozzi, 2007, p28). I appreciate that local interests and actions will influence global economies as they are all articulated together, but the aim of my research is to have impact up to a national level.

All elements of ESD also have to consider social responsibility and justice, not only for the present generation but also for future generations, because our actions now determine what comes next. For example, in terms of setting climate change policy, we are very much at a critical or tipping point. We need to act now to stop warming above 1.5 °C, which is the likely lower temperature limit rise as stated in the *Fifth Assessment Report* of the Intergovernmental Panel on Climate Change (IPCC) (2013). How we respond now determines the impact on future generations, what comes next, and this is the big environmental agenda, not only for Scotland but also globally. To determine how we are

tackling this, one aim of this research will be to focus on how ESD has been embedded within the curriculum in Scotland's Colleges at a national level. I appreciate the curriculum is only one domain in tackling an all-encompassing global issue, however, the curriculum is the domain somewhat within my realm of control, whereas other domains are not. Consequently, the curriculum is central to this project because of its impact on what is learnt, how it is learnt and how that learning then fosters the agency and responsibility of learners acting in the world.

Scottish college education is predominantly at further education (FE) level as FE comprises 82% of college education as opposed to 18% at higher education (HE) level in 2012-13 (Colleges Scotland, online, n.d.). Further education within the United Kingdom refers to education that is additional to school level education, generally to provide access either to the qualifications required to access higher education, which is usually provided by universities, or to provide the skills required to access employment. However, in Scotland, colleges do also offer Higher National Diplomas which are equivalent to the first two years of HE offered by universities. Therefore, defining the big picture of ESD in Scottish colleges will encompass both FE and HE, giving a broader picture than just FE alone. As Scottish colleges deliver at both FE and HE levels, this makes it vitally important that ESD is addressed in the college curriculum on a national level. Critically, it may be even more important that college education in Scotland embeds ESD, because in comparison with the rest of the UK, the college sector in Scotland routinely provides HE 'much more in scale than its counterparts in other parts of the UK' (Griggs, 2012 p10). Furthermore, HE delivery has increased year on year, from 13% in 2009-10 of overall delivery within Scotland's colleges to 18% in 2012-13 (Colleges Scotland, n.d.).

### **ESD and Scottish Colleges**

I feel it is important to stress that this research takes place in Scottish colleges – rather than the rest of the UK – because the integration of FE and HE in Scotland affords the Scottish colleges even greater scope for successfully engaging with a broader audience than if it covered FE alone. So the general claim that it 'makes sense for curriculum delivery to be a national priority and have an integrated approach on a Scotland wide basis' (Griggs, 2012, p19), has heightened importance in Scotland because of the specific nature of the sector. ESD has a potential unique delivery route in the Scottish college system. It was on this basis that the SFC was tasked with taking forward the ESD agenda in tertiary education (Ryan, 2009). This resulted in the funded ESD Scottish College Project, on which I am a

Project Consultant. It should be noted that, although this Project was funded by the SFC and implemented by Scotland's Colleges (now known as Colleges Scotland or College Development Network), there is still currently nothing formal in ESD governance which has been adopted by all of Scotland's Colleges. The decision to engage with the Project is still entirely at the discretion of each individual college and there is no mandatory programme aligned with ESD. The ESD Scottish College Project will be explained in more detail in the following chapters; however, more information about the Project and the learning and teaching materials I have developed are available on the Environmental Association for Universities and Colleges (EAUC) website, as the EAUC are now responsible for driving the Project, at:

[http://www.sustainabilityexchange.ac.uk/college\\_education\\_in\\_sustainable\\_development\\_es](http://www.sustainabilityexchange.ac.uk/college_education_in_sustainable_development_es)

The Scottish Executive initially responded to the UNDESD by publishing *Learning for our Future* (2006), advising what it aimed to achieve in Scottish education during the first five years of the DESD. An important aim of *Learning for our Future* was that by 2014 education would give people the 'knowledge, understanding, skills and values to live sustainable lives by fully integrating sustainable development into all stages of the formal education system' (Scottish Executive, 2006, p1). However, early research funded by the SFC in tertiary education in Scotland discovered that whilst many educational institutions were willing to adopt a more sustainable direction in principle, the reality was that there was little actual willingness to make it a practical priority (Forster, 2006). The result was that although many colleges may have considered sustainability in terms of campus management relating to topics such as waste or recycling, very few had formally adopted ESD successfully in their curriculum delivery at that time (Forster, 2006). A study at national level has not been repeated since, it is also important to note that Forster's study was prior to the UNDESD, meaning the effectiveness of the DESD upon Scottish education remains to be established.

In 2010 the Scottish Government published *Learning for Change: Scotland's Action Plan for the Second Half of the UN Decade of Education for Sustainable Development*. This document reviewed the original plans to evaluate progress made to date, and also put forward the actions required for the next stage of the DESD by taking into account revised Scottish Government climate change targets. It advised that ESD should be about 'raising awareness and understanding of all the issues relating to sustainable development by



providing students with access to highly-relevant new academic courses' (Scottish Government, 2010, p10). However, developing new academic courses that raise awareness of sustainable development does not address the issue of *how* to embed ESD successfully in current course provision. To overcome this impasse, my research tries to aid the implementation of ESD within courses by producing materials which can be a starting point, and by working with teaching staff to give them the confidence to successfully embed sustainability in their teaching.

There has been much debate about ESD reorientation in the curriculum (Hopkins & McKeown 2002; Niu *et al.*, 2010; Tilbury, 2011) and curriculum greening (Junyent, 2007; Leal Filho & Zint, 2016). The reorientation of the curriculum is personalised: 'the need for this is illustrated by response to the question: "what is the most important sustainability issue in your view?", an engineer answered "energy", an economist said "pensions", an earth scientist said "coastal erosion" (Dobson & Tomkinson, 2012, p267). As a result, it could be argued that producing ESD curriculum specific materials is akin to writing a recipe that will not be fit for purpose. I know from experience oftentimes college lecturers are unsure where to start and my materials are designed to bridge this impasse by instilling the confidence required to start to engage with ESD.

Addressing sustainability within the curriculum is not a new concern. The need to reorient the curriculum was highlighted by Orr (1992) over two decades ago, but regardless of this it still remains a problem today. Orr (1992, p4) stated that the 'crisis of the biosphere was not so much a problem *in* education but *of* education'. Many of the decisions creating this 'crisis' are made by governments, which are of course critical to successful educational reform. However – while there are exceptions – and despite declared government policy, I believe that ESD in Scotland's Colleges is still at best very patchy, mirroring the situation in HE institutions as reported by Hopkinson *et al.*, (2008), and as I have already stated has not been evaluated at a regional level since 2006. To compound the problem, where educational reform *has* been achieved, ESD even now remains very discipline-orientated and there is a need to move beyond the obvious environmental science, geography and land management areas to integrate sustainability holistically within all FE and HE learning and teaching.

With regards to science, technology, engineering and mathematics (STEM) subjects, Hopkinson and James found 'experiences in the UK however highlight that outside of engineering and geographic disciplines that engaging science and technology lecturers with

ESD is more difficult than within the social sciences and humanities’ (2010, p367). Where sustainability tends to be most pronounced within the STEM subjects is probably engineering, particularly civil engineering, owing to the nature of engineering activities which ‘typically involve consumption of energy and resources, and create changes in the physical environment’ (Hopkinson & James, 2010, p367). The UK Royal Academy of Engineering supports this perception and has produced a guide to ensure that:

graduates leave their courses inspired by, and with understanding of, both the concept of sustainable development and the place of their chosen engineering specialism in delivering it, and with relevant knowledge and skills to apply in the engineering profession (Royal Academy of Engineering, 2005, p3).

However, in other ‘STEM subjects, partly owing to the subject area being seen as more “objective”, with fewer direct links to people (therefore) reflective practice is less common than in areas such as health studies or medicine’ (Hopkinson & James, 2010, p376). The overall risk, I believe, with any assumption that there are obvious areas in the curriculum where ESD can be housed – whether this be STEM subjects, social sciences or the humanities – is that ESD is confined to these areas and not considered holistically across the entire curriculum, particularly college vocational education, if ESD is viewed as an academic discipline and not of vocational concern. Furthermore, even if particular areas are engaging with ESD, we must be additionally wary that this may be chiefly from an economic or business rationale. I am concerned there is a danger if it is *believed* that there are obvious curriculum areas for ESD, this leads to ESD being outsourced to specific departments, to the detriment of all other curriculum areas which should equally engage with ESD. This tendency in turn could lead to the misbelief that ESD is being addressed and appropriately delivered in the relevant curriculum areas where it is *believed* it should reside. Such a stance allows policy makers and deliverers of education to salve their consciences by passing responsibility to specific areas instead of tackling ESD across the entire educational spectrum.

Currently where ESD is deliberated, it tends to be embedded within courses where there is an obvious disciplinary or applied connection, such as environmental science, or where it is required due to legislation, such as some engineering and construction courses (Jones *et al.*, 2008). Within Scotland’s Colleges there are also subject specific courses, particularly at the land based colleges such as Scotland’s Rural College which specialises in land based and animal care education and training and provides courses on agriculture, conservation

and horticulture. These types of courses have sustainability as an integral part of the course, or the course is of a nature where obvious connections to sustainability can be easily made. The issue of where ESD sits in the Scottish college curriculum generically has been further complicated by major changes to the sector over the last five years. The impact of the restructure of the Scottish college sector upon ESD progression and delivery will be discussed in more detail in the following chapters.

Another area where sustainability is more likely to be considered explicitly in colleges is in strategies for estates management, which directly focus on environmental issues. A report by Her Majesty's Inspectorate of Education (HMIe) – now Education Scotland – found that curriculum issues are however often overlooked (2009). For instance, courses such as Hairdressing, Beauty and Complimentary Therapies, Health and Social Studies, Care or Computer Studies, are not automatically required to include an ESD element. There is nevertheless no reason why virtually any area of the curriculum cannot have elements of ESD integrated with some creative thinking (Roberts & Roberts, 2007). The greatest barrier to overcome here is the 'willingness or ability of the academic staff to engage' (Hopkinson *et al.*, 2008, p437). Sterling (2013) goes further and advocates a paradigm shift where the curriculum is reoriented with ESD at its heart and permeating throughout so that it is a transformational dynamic core which is integral to driving the curriculum towards sustainability.

In spite of general policy imperatives, it has been recognised that in Scotland 'only a few colleges have embedded sustainability within their learning and teaching strategies' and they 'need to develop systematic approaches for embedding sustainable development within all programmes' (HMIe, 2009, p48). This may in part be because 'only a few colleges include induction training in sustainability for new staff. However, the majority of colleges have not developed sufficiently in this area' (HMIe, 2009, p28). Furthermore, 'in most colleges sustainability issues are not embedded systematically within design of programmes and only a few colleges included sustainability with their programme delivery guidelines' (HMIe, 2009, p48). The question to ask here is, if HMIe recommended in 2009 that colleges needed to address sustainability in learning and teaching strategies, staff development and design of programmes, why has progress been so slow and the sector not responded accordingly? As will become clearer in the following chapters, I believe this is largely due to the significant changes within the sector since 2009. However, it may also be an organisational issue in that HMIe chose not to performance manage ESD so it could

be allowed to develop informally. Whether this strategy has been successful or not will be considered in my research.

ESD therefore remains very discipline orientated and there is a need to move beyond the obvious environmental science areas to integrate sustainability holistically within all FE and HE learning and teaching. This imposes difficulties on educators because of the ‘disciplinary structure of most post-primary formal education’ (Smyth, 2006, p249). The same problem has also been evidenced by research in Australia, which suggests that whilst many universities advocate ESD in their policy documents, there is little evidence to suggest it is included within learning and teaching beyond speciality courses, or outwith the interest of a few enthusiastic academics (Christie *et al.*, 2012). There is also a lack of appropriate tools in place to measure how and where ESD is embedded within the FE-HE curriculum, and where it does exist the tools are not available to measure its effectiveness.

As stated earlier, sustainability is more likely to be considered in campus management. The tools pertaining to sustainability in education in Scotland also tend to focus on the campus and building performance. For example, the Universities and Colleges Climate Commitment for Scotland (UCCCCfS), a SFC funded project managed by the EAUC, is a public declaration by educational institutions to address climate change and reduce their carbon footprints in line with the Scottish Government targets of an 80% reduction in carbon emissions by 2050 (Climate Change (Scotland) Act 2009). This strategy was in its early years heavily based on campus management approaches, but it did not effectively measure the curriculum, meaning there was little requirement on planners to address this (Salter, 2009). However, in the light of the work I have conducted with the EAUC, I am aware that in recent years it has been recognised that the UCCCCfS needs to focus more on ESD, even if their website still has quotes such as the one below that are still very pertinent to climate change and low-carbon.

Scotland’s universities and colleges are making a valuable contribution to tackling climate change. Building on these achievements will be key in helping Scotland meet its climate change targets and in creating a more resilient, low-carbon society. The choices we make in the places we live, work and learn have an impact on climate change both now and in the future and it is important that we all make a positive contribution (Michael Russell, Cabinet Secretary for Education and Lifelong Learning, October 2014).

More information about the UCCCfS is available on the EAUC website at;

[http://www.eauc.org.uk/universities\\_and\\_colleges\\_climate\\_commitment\\_fo2](http://www.eauc.org.uk/universities_and_colleges_climate_commitment_fo2)

It is clear that, despite valuable ethical and educational commitments, the curriculum remains largely marginal to these policies. In order to remedy this there needs to be effective top-down management to implement ESD, met by middle-out knowledge and willingness of learning and teaching staff to deliver ESD, to meet the bottom-up growing demand of students to be taught ESD.

### **Research Rationale**

The overarching research theme of this project is to:

- Investigate to what extent, as an active practitioner, my work can impact the ways ESD is developed in colleges where I can influence it as an insider, and to begin an excursion into unfamiliar un-researched territory to provide an agenda for future researchers.

Within the overarching research rationale – which I consider to be my major research question – there are a number of associated or secondary questions, ideas and factors that need to be identified and addressed in order to determine if I can influence ESD practice to any significant degree. As well as attempting to answer the questions and suggest possible solutions to overcome the barriers there are also a number of key ideas I want to develop.

### **Research Areas and Concepts**

Research areas that will be interrogated include:

- Outlining the impact of the United Nations Decade of Education for Sustainable Development on college ESD at a strategic level in Scotland.
- Evaluating to what extent policy, theory and practice are integrated for ESD in colleges in Scotland and investigating if there is an awareness and knowledge of ESD.
- Establishing how successful Scottish Government policy concerning ESD in colleges has been and how it has been implemented.

- Assessing the level of senior management's knowledge regarding ESD within the curriculum in Scotland's colleges.

As well as having an overall research theme I am trying to drive, and research areas I want to interrogate, there are also a number of key concepts I want to explore and develop which are:

- Critically reviewing current theory and practice to see if it indicates policy change.
- Devising an appropriate methodology that integrates theory, policy and practice as a result of the teaching materials I have developed as an ESD practitioner.
- Providing a reflective critical analysis of my intervention to establish its effectiveness.

'A true picture of ESD in Scotland is difficult to describe and present' (Higgins & Woodgate, 2012), and this research aims to answer why this difficulty exists.

Whilst none of these key ideas on their own is entirely new in ESD thinking, the overall approach adopted by this project is genuinely innovative because I was placed in a position to combine research at a national level, with employment as an ESD practitioner, not only at a local level but also on the ESD in the Scottish College Sector Project at a national level. The shared aim across all of these roles was to have ESD accepted as an integral part of the curriculum rather than a bolt-on. Furthermore, the originality of the approach being implemented also resides in my role as the writer of the ESD materials which are part of the intervention and are being used by staff and students. I am then conducting research to evaluate the effectiveness of these materials based around the key ideas which are embedded within my approaches. I also hope to consider the complexity of the ESD field as the research progresses, since this *is* a protean and evolving concept whereby it appears one question or issue has been resolved only to discover this generates another set of questions.

These research areas and key concepts have grown out of my experiences working in education and also to a certain extent because of the opportunities that have become available to me in my career. I do not believe that these key concepts can be appraised easily or briefly because to achieve the required outcomes – I shall argue – demands a change in education and a behavioural shift. Furthermore, to effectively engender this

change will involve social and cultural realignment which is beyond the scope of what I can measure during the research period.

I want my research to be broad in order to assess the bigger picture of ESD development in Scottish colleges. However, I also wish to examine the finer details of ESD development at course, student and teaching levels taking into account the ways in which the research has developed, evolved and branched over time. This is highlighted by my methodology which is correspondingly iterative in nature. In addition, owing to career opportunities that have arisen there is an inherently reflexive element to the methodology. I want to determine what influence and impact *my* practice and *my* interventions have, if any – where I can measure it – within the larger context of ESD policy and theory in Scotland.

While the individual research questions and themes are important, the most critical element is how they integrate together to provide the bigger picture of ESD awareness, progress and success in Scotland's Colleges. My research will be influenced by my own thoughts and feelings as I have been immersed in Scottish college education for a number of years. I will be taking my own ambitions and motives and applying them to the changes I see around me. This ethnographic element is central to my research – as the ethnography is very much an integral part of the intervention – and this element will be woven throughout the thesis confirming that I am not a dispassionate interventionist.

### **The Rationale**

Sustainable development was a strategic aim of the *Scottish Funding Council's Corporate Plan* (2009-2012). The plan identified key challenges for tertiary education in Scotland, including that ESD should be integrated into curricula and universities and colleges should have access to high quality materials to enable them to embed ESD in their courses (HMIe, 2009). However, neither the *SFC's Corporate Plan* nor HMIe advise where these high quality materials will come from. Maybe as a result of this lacuna, one of the key aims of the ESD Scottish College Project for which I was responsible was to develop materials and evaluate their effectiveness. These gaps were confirmed by Ryan (2009) who found that 'at subject level, access to pedagogic development is needed, so that academics can be responsive to institutional trajectories and opportunities for ESD' (p20). As with most HE ESD research, Ryan's findings were chiefly evidenced in university education where the shortfall in appropriate materials has been acknowledged. There is however also evidence of this in Scotland's Colleges (Forster, 2009). The *Scottish Funding Council Strategic*

*Plan 2012-15* continues to acknowledge the importance of sustainable development in education for Scotland's economic and social benefit as well as promoting environmental sustainability in resource efficiency and to reduce carbon emissions in line with Scottish government policy.

Whilst educational bodies are recognising the importance of ESD, there still remains a lack of research evidence to establish the most beneficial ways of developing and delivering a systematic, progression-based yet process-based sustainable development education curriculum. This 'is indicative, perhaps, of the complex nature of sustainable development education' (McNaughton, 2007, p634). But 'an opportunity exists in Scotland, to add to the body of knowledge through qualitative research linked to sustainable development education curriculum development' (McNaughton, 2007, p634). Whilst accepting McNaughton's observations, I believe more than just research is required, as without effective knowledge exchange transformation is unlikely to proceed. My research hopes to bridge the gap in knowledge exchange using the avenues available from the SFC and the EAUC to effectively disseminate the materials I have produced with all colleges across Scotland. It has been established that there is an urgent need for appropriate materials to be developed and made available to teaching staff because 'without access to a good, reliable, repertoire of illustrative case histories life for the educator can become difficult, and there is a dearth of suitable material' (Smyth, 2006, p255). My research aims to address both the issues of a lack of appropriate materials and the current absence of effective knowledge exchange. In order to achieve this, it is clear that this is a multi-stakeholder challenge and the different stakeholders are becoming clearer.

A lack of formal policy and curriculum guidance appears to be a college wide issue at a national level. A recent review of FE governance in Scotland determined that since 1992 the Scottish Government has not audited the FE sector to determine if it is fit for purpose or has what it requires (Griggs, 2012). Colleges have in turn also complained that 'Government does not make it clear to the sector what is expected of it' (Griggs, 2012, p20). This is not just a problem in relation to ESD guidance but is a general issue with FE governance. However, a specific issue with ESD across the sector is that although to a certain extent 'most organisations are aware of other connected initiatives, a true picture of ESD in Scotland is difficult to describe and present' (Higgins & Woodgate, 2012). Why this difficulty of describing and presenting ESD in Scotland's Colleges exists will be one of several questions my research aims to answer.



One particularly thorny issue in Scottish FE at the moment is that the sector is going through a period of significant change especially with college mergers. These difficulties sometimes add to the long list of obstacles referenced above and leading staff perhaps to feel that ESD is irrelevant because ‘there’s enough change happening in the sector – now isn’t a good time to take on any more!’ (Sterling, 2012, p29). Some of the recent changes are part of the Post-16 Education (Scotland) Act 2013 which is ‘a Bill which aims to make provision about the support for, and the governance of, further and higher education institutions, including provision for the regionalisation of colleges’ (Scottish Government, 2013). This Bill has recently been implemented resulting in painful college mergers which have meant uncertainty for many members of staff due to staff reductions and changes in course provision. Trying to engage senior management and teaching staff with ESD has proven challenging in light of these changes in the sector, since obviously ESD provision may not be currently high on staff agenda when they are fixated with job security. One college Principal even confirmed this to me when he advised that whilst in principle he agreed with ESD, he was preoccupied with more pressing matters such as deciding staff redundancies. The Post-16 Education (Scotland) Bill and the impact it has had on Scottish colleges will be discussed at length in the next chapter.

### **Research Impact and Originality**

The main rationale for this research is that there is very little published research on embedding ESD in the FE curriculum in Scotland. Moreover, there is very little published research because I believe there has been limited progression of ESD in the Scottish college curriculum. Hence the reason this research is required and critical. I have ideas about how to overcome the obstacles that exist to embedding ESD and believe that ESD will be more effective when:

- It is made specific to what the student is studying and is not an additional bolt on.
- Educators are shown how they can link ESD to what they are already teaching so there is as little additional work as possible.
- Educators and students understand that ESD is as important as any other core skill and particularly useful as an employability skill.

The barriers to embedding ESD in the curriculum and my ideas of overcoming these barriers will be discussed in greater depth in the Methodology Chapter.

This research is fundamentally important because it has the potential to have a positive impact upon ESD development in colleges in Scotland. It may also influence government policy concerning ESD as well as have a wider societal impact. At a global level, successful ESD can help achieve the aims of the UNDESD. Some of the problems ESD aims to overcome are life threatening to many people - for example, the issues that the United Nation's Millennium Development Goals (MDGs) aimed to redress, such as ending extreme hunger and poverty, reducing child mortality, achieving universal primary education and ensuring environmental sustainability. Although the MDGs have been superseded by the Sustainable Development Goals (SDGs), the same potential ethical drivers can be seen at the heart of this research. The SDGs address the same issues as the MDGs, but they are much broader and have sustainability woven throughout them which 'reiterates that education is not only an end in itself but also a means to achieving a broad global development agenda' (UNESCO, 2014, preface). Furthermore, according to the Organisation for Economic Co-operation and Development (2010) there are approximately 135 million students in post-secondary education globally and this number is expected to more than double by 2025 with nearly all of this growth in developing countries (Maslen, 2012). As student numbers increase the range and importance of ESD also widens making any research that positively impacts ESD of even greater importance.

This research is original because while there is overlapping work taking place in HE across the UK, there is no similar research being undertaken in the curriculum in Scottish college education. The research focus means there is the potential to impact ESD policy in the sector leaving behind a legacy for ESD curriculum development in Scottish college education. ESD is multi-faceted and there is an abundance of moving projects which are ongoing, however I have yet to come across a similar project which has brought together all of the points I have raised and will investigate. In addition, there is similar research to establish ESD progress and to advise further progression and change, but not where the researcher is creating the materials or facilitating the interventions at a national level. This means there is an exploratory element to this research, as it aims to go beyond reporting ESD development to determine how and why ESD develops. ESD is a policy jigsaw because other things converge on ESD such as politics, ethics and economics and these cannot be ignored and will be considered throughout the research. This research therefore is not descriptive but aims to be interventionist as it is seeking to evaluate the impact of an initiative for which I am the responsible officer, establishing the conditions under which effective ESD can flourish.

## **Framing the Research: An Interpretivist Approach**

This section is deliberately written in a narrative format to extend the parameters of what I am doing, to not only explain my background, but also to illuminate my position within my research as an interested party and not an impartial observer. I also want to make it clear that there is no distinction between me as a researcher and me as a person and as a result, the methodology is interpretivist in places because the research is a critical accompaniment to my work as a Sustainable Development Adviser. I make no effort to conceal my partisan interests because I am a committed environmentalist myself and I am an advocate of effective ESD. Instead of these disclosures impeding my research I believe they can enhance it by combining first of all my personal ethics, my creativity as an educator and resource developer and my reflective powers as an enquiring research led professional.

Obviously, I have an unquestionable individual stake in the fortunes of the research initiative, however I do not feel this invalidates my positionality because I can draw upon tested social science methods for critically assessing and evaluating my own practice. In the past ‘most social science and educational research methods textbooks have abstracted the researcher from the process of research’ (Walford, 1998, p2). This research, however combines interpretivist qualitative approaches with constant decision-making, that not only questions the practical process, but also understands how my personal inferences impacts upon it.

My current research could not be further removed from my early career dealing with pensions and life insurance in the finance industry. Over time I became disillusioned with the career I had spent 17 years developing and realised the part I enjoyed most about my job was training and mentoring others. This led me to the decision to leave the finance industry and retrain as a teacher and, the opportunity arose when I relocated from Edinburgh to Dumfries, owing to my husband’s career, and decided to go to university.

The Dumfries Campus of the University of Glasgow offered a select choice of courses but I decided the best option would be a Health and Social Studies undergraduate degree, upon completion of which I would undertake post graduate teacher training. At this stage I still had not decided whether I wanted to teach in primary or secondary education. At the same time as starting at university I applied for a part-time position with a Scottish college as the Student Association Liaison Assistant, responsible for providing support to the Student

Association Executive Members in organising events and campaigns, and was successful in securing the position.

I began the Health and Social Studies programme, however the Psychology module – which was the part of the programme in which I was most interested in – was cancelled, which meant I had to pick an alternative module. As the choice of modules was limited on the small campus I chose a module from the Environmental Sustainability programme and as soon as I started it, it was like a light bulb switching on in my head. I just knew this was what I wanted to do. My initial decision to study Health and Social Studies had not inspired me in any way and I saw it only as a means of obtaining a degree to make me eligible for teacher training. Environmental Sustainability was completely different. At first I did not make a conscious decision that I was going to link my interest in environmental issues with my college employment but over time it became obvious to me that this was what I wanted to teach, and I wanted to teach it in tertiary education.

The more I learnt about environmental issues and sustainability the more I realised I had to try and raise awareness about environmental concerns wherever possible. As I had responsibility for helping with student campaigns and events in the college, I found I could add a sustainability dimension to most things. This is partly where, I believe, my ethical foundation in relation to my research stems from. Initially I was interested in the subject matter and in developing interesting ways to engage students with environmental problems, but over time I found it also generated excitement in me when I felt that students developed positive values towards sustainability. I believe this is where the ethical base of my approach to ESD education really developed and broadened and I started to develop the values that underpin this research. The more I learnt, the more I became aware that ESD is not only about what we teach in relation to current environmental issues, but also about realising we are only '*stewards*' of the planet and that we should all have access to education that makes us aware of our potential impact upon future generations. So as the current educators we need to care about how and what we educate those that will outlive us. Some of the ways I tried to raise this initially in the college through the Student Association included:

- 'Health Week', which was given the strap line 'love yourself, love the planet' and included elements about the 'health' of the planet and other species;
- Equality and diversity now incorporated biodiversity;

- ‘Citizenship Week’ held countless opportunities to include sustainability including fund raising for local and national charities and bridging the generations by working with local care homes to bring together students and the elderly.

All of this was before I had even heard of the term Education for Sustainable Development.

Obviously some projects worked better than others. I learnt that students do not respond well to being preached to, and if I only provided information this was how it could sometimes be perceived. I started to share my own personal experiences and how I found it difficult to live sustainably. Also, if I linked my experiences with visual or practical activities the students were more likely to engage with the initiatives. These experiences are what motivated me to think that these connections with students were only happening with students that came to Student Association events. The bigger idea started to grow whereby I knew all students had to be taught about sustainability, and this is where I started to consider the curriculum.

Once I completed the MA in Environmental Sustainability I was unsure how I was going to proceed, but knew I wanted to learn more so decided to study for an MSc in Carbon Management, again at the Dumfries Campus of the University of Glasgow. Part of this decision was also based on what was available on the campus as travelling elsewhere for post graduate teacher training would have been extremely difficult with a young family and a husband who worked and lived away from home during the week. As part of the MSc I undertook a 60 credit work placement within the college where I was employed, in lieu of a dissertation, to start to formally address effective ways to embed ESD in the curriculum. This placement was where the first ESD workbook - *Hairdressing Heroes: Fighting the Carbon Battle* – was developed.

To develop ESD learning and teaching materials that would be effective, I quickly realised, would need a very specific method. The trap of sermonising what is right and what is wrong in relation to sustainability and how we live our lives, is very easy to fall into. However, I had already established with my earlier cross college initiatives with the Student Association that this approach, rarely, if often, works. My approaches make it clear that I do not live within the confines of one planet myself and I want to provide information to enable users of my materials to make informed sustainability choices. I share my carbon and ecological footprints, I talk about ‘my love of stuff’, particularly

shoes and handbags, I make it clear that oftentimes there are no right or wrong answers. Whilst doing this, I tell students that there are central themes in society that impact upon me, just as they influence them.

It was also at this stage that thoughts for further development, and of research into ESD in Scottish FE began. This interest further developed because of conversations with my Supervisor, Dr Bethan Wood, who also had an interest in the subject. The relationships I built with students had an important bearing on my opinions of ESD and how I thought it could best be delivered in FE. I needed to move beyond optional extra-curricular activities and make connections that all students could potentially engage with, and the only way to do this was to embed ESD within the curriculum.

I found that adding sustainability to different areas of college life was a relatively easy thing to do and this led me in time to think that there would be virtually no area of the college, both cross-campus and in the curriculum, where with some creative thinking I could not incorporate ESD as some level. I believe at this stage I began to get a sense of my consciousness enlarging – the idea of just adding ESD on was not feasible or enough – I had a growing recognition that ESD principles also need to be informing what is done and why in college procedures and practice.

After completing my master's degree, and as a result of the work I started in the college with ESD in the curriculum, the college created the part-time role of Sustainable Development Adviser for me, alongside my part-time position with the Student Association. This was innovative thinking at the time in Scottish college education as the main remit of this new position was to embed ESD within the curriculum. Also, at that time (2010) there were very few specific sustainability staff members in Scottish colleges. If one was employed, they were likely to be responsible for carbon reduction and estates management as sustainability 'is a key priority in the management of estates' (HMIe, 2009, p5). At that time, successful sustainability programmes routinely engaged with students through the Student Association or by community engagement, but the curriculum was largely ignored. This was evidenced by development being required for the 'systematic embedding of sustainability within the design of programmes in all curriculum areas and the integration of sustainability within learning and teaching processes' (HMIe, 2009, p6). The curriculum really was overlooked and neglected at that time, and I think the college created this role for me as ESD was becoming a buzzword at the time. It was a perfect storm, as I was in the right place, at the right time, studying the right thing.

Each of the roles I occupied in the college with the Student Association and sustainability in the curriculum were extremely compatible and complemented each other perfectly. Research, indeed, has proven that cross college student led activities can help with embedding ESD in the curriculum (Lipscombe, 2008). Unfortunately, not long afterwards, as a result of changes to funding in the FE sector, which will be discussed in more detail later, my position as the Student Association Liaison Assistant was made redundant. My role as the Sustainable Development Adviser continued, however it needs to be recognised that this role was only for 14 hours a week for 40 weeks of the year, so very much part-time. However, over two years the hours I had for embedding ESD in the curriculum were cut, first by a quarter whereby these hours were now for carbon management, and then by half with my hours split between carbon management and ESD in the curriculum. By 2015 the role of Sustainable Development Adviser no longer existed in the college.

At the start of the 2015-16 academic year my role in the college changed to Climate Change Officer, where I was responsible for the college's carbon management plan and implementation. This role is for one day a week for 36 weeks. When my employment was changed from the Sustainable Development Adviser to the Climate Change Officer, I was told that as I had been doing the sustainability work in the curriculum for four years now, it should therefore be complete. Even though this role was part time – and the hours reduced year on year for the last two years – it was believed it should have been concluded within that time. I believe that ‘after a few years of focusing on the theme, some people felt in a way which can be described as a “Sustainability-fatigue”: ‘people did not like the concept of sustainable development or the story of uncertainty and precaution that is inherently linked to sustainable development’ (Verhulst & Lambrechts, 2015, p199). However, all of these experiences have left me feeling more determined than ever to progress learning for sustainability further. I have seen many positive changes but still feel there is a long way to go. Whilst I have matured as an ESD Practitioner in a positive way, I have also experienced periods of disappointment and apathy when I feel any progress made will be lost without a continued impetus on the importance of the task. To overcome this, I have needed to remain positive because it would be easy to become jaded when presented with the challenges brought about by not only the sector changes, but also on how these changes have affected my employment and research.

I believe it is important to explain the process that has brought me to the current position in my career, as all of these experiences over the last few years in the environment in which I studied and worked have helped to shape my current philosophical position, which will be

explained in detail in the Methodology Chapter. This is because every researcher regardless of what they set out to do is influenced by many factors, in my case the move from an undergraduate degree with an empiricist positivist approach to this research project, which adopts a social science paradigm and methodology, and a more inter-subjective style.

The scope of my original research proposal was enormous, and probably consisted of several different research projects, aiming to evaluate ESD in FE and HE, not only considering the formal curriculum but also evaluating extra curricula activities, across Scotland. It was quickly established that this would not be possible, and the scope was narrowed to the Scottish college curriculum, with particular emphasis on what, if anything, I could do to positively change the ESD landscape and embed ESD in the curriculum in the college in which I worked. The scope did then increase as I was appointed a Project Consultant on the SFC funded Scottish College ESD Project, which provided opportunities to work with other colleges.

This overarching narrative helps to explain the ‘flavour’ of my research and how it has evolved. In the beginning I knew of questions I wanted to ask but was unsure of how I would be able to answer them. How would I gain access to educational institutions to conduct the research? Would they be receptive to my ideas? The methodology has unfolded as opportunities in my career have arisen, providing access to college staff and students. This has enabled me to broaden my research horizons beyond my employing college. Over this period, indeed, I also came to realise that current educational models – where they existed – in relation to ESD were perhaps well intentioned but often inadequate. As a result of these realisations and career developments the scope has evolved over the years to the research that is now presented.



## Chapter Two – Literature Review

### Chapter Purposes

- To indicate where this thesis is situated within the landscape of education for sustainable development (ESD) in Scottish education.
- To provide an overview of ESD history and important landmarks and documents that have impacted upon its progression in Scotland.
- To explain how recent changes in the Scottish College sector affected the research process.
- To introduce the barriers to embedding ESD in the curriculum and offer possible solutions to overcome them.

### Introduction

This chapter aims to examine several strands of relevant literature, which are, first, the scientific literature assessing the current state of the planet. Secondly, the sociological literature underpinning our understanding of the current *environmental crisis* afflicting humanity, and thirdly the literature supporting and developing the concept of education for sustainable development (ESD). Clearly, the interaction between these literatures is also a major concern.

The chapter will also consider who is leading the agenda on ESD, starting with the scientific, academic and the professional perspectives, including education, all of which in turn helps inform government policy. Government policy itself will then be evaluated to determine how and to what extent it translates into ESD practice in Scotland – particularly in Scottish Further Education (FE). Finally, the major barriers to embedding ESD in the curriculum will be studied and possible solutions to surmounting these barriers will be suggested from out of the literature itself.

### The ‘Environmental Crisis’

There is now widespread concern that the model of development that is evident across the globe is unsustainable. We are faced with the urgent need to recast our ways of living away from ones that rely on the unsustainable consumption of resources, the degradation of ecosystems and the exploitation of people, towards a model that strives to enhance the well-being of all human beings within the limits of our planet (UNECE, 2012, p6).

The ‘environmental crisis’ is a multi-dimensional issue and part of the problem is undoubtedly anthropogenic climate change. There is now little argument against the fact that the climate is becoming warmer owing to human actions resulting in significant worldwide changes in physical and biological systems (Rosenzweig *et al.*, 2008). This has been confirmed by the Intergovernmental Panel on Climate Change (IPCC), which is the United Nations General Assembly endorsed leading international organisation responsible for assessing and reporting on climate change. The IPCC was established in 1988 by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in order to provide clear, expert scientific opinion on climate change and its potential environmental and socio-economic implications. According to the IPCC (2013):

Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased (p2).

These changes are attributed to the fact that ‘human influence on the climate system is clear as evidenced by increasing greenhouse gas concentrations in the atmosphere, positive radiative forcing, observed warming, and understanding of the climate system’ (IPCC, 2013, p13). Furthermore, the IPCC states that the global mean surface temperature change for 2081-2100 relative to 1986-2005 is projected to be in the *likely range* (66-100% probability) of 0.3-4.8 °C dependent upon different scenarios (IPCC, 2014, p20). An increase in temperature will have many implications by the end of the twenty first century, for instance:

- globally warmer and more frequent hot days and nights and fewer cold days is *virtually certain* (99-100% probability),
- globally the frequency and intensity of heat waves are *virtually certain* (99-100% probability),
- heavy precipitation events with an increase in frequency and intensity are *very likely* (90-100% probability) over most land areas,
- increases in the intensity and/or duration of drought is *likely* (66-100% probability) on a regional to global scale, and
- it is *likely* (66-100% probability) that there will be an increased incidence and/or magnitude of extreme high sea level (IPCC, 2013, p5).

However, one of the ironies of the *environmental crisis* is that those most vulnerable to climatic variability often live in countries that have contributed least to historical greenhouse gas emissions (IPCC, 2007). Therefore, the whole area also needs to take into account social concerns such as global inequality, and the gap between the rich and the poor as the poor will be most disadvantaged by climate change, as well as addressing the physical challenges anthropogenic climate change will cause. As we shall see, ESD must also take these issues into account. Additionally, these deleterious changes are all happening while the global population continues to boom with estimates of a population of over nine and a half billion by 2050 (United Nations, 2013). Climate change impacts, social inequality and population growth are just some of the factors that demonstrate how multi-faceted the *environmental crisis* is.

At this point, it is important to distinguish in the environmental debate between prevention, mitigation and adaptation. Prevention and mitigation may be preferable but adaptation is inevitable. Whilst the impacts of climate change will be more severe in some countries than others, 'all societies are ill-adapted to climate to some degree. In other words, climate extremes and variability imposes costs on all societies' (Prins *et al.*, p12). It also needs to be recognised that 'adaptation and mitigation are not trade-offs, but complementary strategies' (Prins *et al.*, p15). In order to address climate change, whether through adaptation or mitigation, the public need to be educated about the dangers of climate change, however, even more importantly, they need to believe it is happening. Despite enormous efforts to persuade the public that anthropogenic climate change is real, the number of climate change deniers is increasing, and in high carbon emitting countries such as the United States and Australia, has increased to over a third of the population (Leiserowitz *et al.*, 2011; Leviston *et al.*, 2011). Bain *et al.* (2012) pointed out that it is extremely difficult to change attitudes of climate change and climate science and activists should aim to change opinions by promoting pro-environmental behaviour instead. Environmental citizenship may be the answer, by emphasising the other positive benefits of tackling climate change such as sustainable development and improving health (Bain *et al.*, 2012). I think what is important to consider here, is that climate change has to be tackled across a wide spectrum, from the pro-IPCC believers to the climate change sceptics and dissenters, and to do so successfully requires a range of approaches.

According to Stern (2007), climate change should be considered at a global scale as a major environmental problem. In order to address the issue effectively there is a requirement for global cooperation, involving all nations in agreeing to international policy

such as the United Nations Framework Convention on Climate Change (UNFCCC), the ultimate goal of which is ‘to achieve the stabilization of greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system’ (UNFCCC, 1992, Article 2). This is imperative as ‘continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system and in order to limit climate change will require substantial and sustained reductions of greenhouse gas emissions’ (IPCC, 2013, p17). Many vital key stakeholders recognised from the outset the place of education as a tool for mitigation and adaptation to the challenges that will ensue from anthropogenic climate change. Without ESD, it could be argued, the means of educating the next generation to ensure they understand the importance of such global cooperation will be reduced because:

Notwithstanding the centrality of education in treaties, covenants and agreements, the international community has yet to recognise the full potential of education as a catalyst for development. While many national governments have increased their commitment to and support for education since 2000, its emphasis among donors and in many countries remains vulnerable to shifting conditions – financial and otherwise (UNESCO, 2014, preface).

Some of the most pronounced effects of climate change relate to the availability of food and water (IPCC, 2014). The impacts of climate change on food systems are expected to be widespread, complex, geographically and temporally variable, and profoundly influenced by socio-economic conditions (Vermeulen *et al.*, 2012, cited in IPCC, 2014, p4). At the lower end of the predicted temperature increases range, 1-3 °C, global food production might actually increase, however the distribution will not favour those most in need, and yields may decrease in many developing countries particularly sub-Saharan Africa (IPCC, 2007). Under scenarios of high levels of warming – temperature increases of 3-4 °C or higher – ‘models based on current agricultural systems suggest large negative impacts on agricultural productivity and substantial risks to global food production and security’ (IPCC, 2014, p3). ‘Such risks will be greatest for tropical countries, given the larger impacts in these regions, which are beyond projected adaptive capacity, and higher poverty rates compared to temperate regions’ (IPCC, 2014, p3). Higher temperatures also result in higher radiation levels which increases water use in plants meaning water stress will be a major problem for plant growth, let alone the stress it will directly cause humans also competing for drinking water. ‘Climate-related hazards exacerbate other stressors, often with negative outcomes for livelihoods, especially for people living in poverty.

Climate-related hazards affect poor people's lives directly through impacts on livelihoods, reductions in crop yields, or destruction of homes and indirectly through, for example, increased food prices and food insecurity' (IPCC, 2014, p7). There is little doubt and the general 'consensus is that unchecked climate change poses a self-inflicted existential risk to humanity' (Klein, 2014, p15). Similarly, to the danger of confining ESD to specific curriculum areas, climate change learning has 'generally been corralled in physical geography and science disciplines' (Kagawa & Selby, 2015, p33). This contributes to 'limiting knowledge of climate change to global warming science and green technological fixes for climate change mitigation and adaptation' (UNESCO/UNEP, 2011, p55).

Another area of human life where there will be significant adverse effects from an unsustainable future, and with which modern education is understandably preoccupied will be health. Warmer temperatures and changes in rainfall patterns increase the likelihood of vector-borne diseases, such as malaria, and water-borne diseases such as cholera (McMichael *et al.*, 2003). There will also be a much greater risk of diarrhoeal disease from flooding and sewage contaminating water supplies, as well as deaths and injuries from adverse weather events such as increased numbers of tropical storms (IPCC, 2014). As developing countries lack the infrastructure to cope as effectively with these events, they are far more likely to feel the consequences than developed countries.

Those in developing countries will feel the effects of climate change to a greater extent than the developed world and this will be further exacerbated by population growth. The world's population is set to increase from its current level of over 7 billion to approaching 10 billion by 2050 and more than a billion people of this increase will be in Africa (Thornton *et al.*, 2009). A larger population will mean increased energy demands which will result in higher GHG emissions levels if energy demands continue to be met by fossil fuels (Hopwood *et al.*, 2005). Whilst population growth has stabilised, and is even declining in some developed nations, population numbers are still rapidly growing in developing countries. One long-standing argument has been that developing nations have helped to create their own problems as a result of this (Ehrlich & Ehrlich, 1968). This argument has persisted and is now compounded by climate change giving it heightened validity. Further exacerbated by the 'hidden agenda of 'business as usual' in which the social and economic drivers behind the heating of the planet are denied curricula space and, hence, any critical interrogation by learners' (Kagawa & Selby, 2015, p33). Turner (2008) compared actual population numbers against predicted population scenarios within The Limits to Growth model (Meadows, *et al.*, 1972), and established that the issues

with food and water security and supplies match the feedback dynamics of ‘overshoot and collapse’ predicted by Meadows *et al.* (1972). Therefore, it could be argued that the real sustainability issue is not the increase in GHG emissions but population growth instead.

It should be noted that the UNFCCC defines climate change as ‘a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods’ (UNFCCC, 1992, Article 1). The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes. Even in the light of near overwhelming evidence that anthropogenic climate change is happening, there still remain some climate change sceptics who are questioning whether society should take ‘pressing and radical steps to combat change, even at the expense of social and economic progress’ (Shani & Arad, 2014, p82). Shani and Arad (2014) further claim that ‘the theory of anthropogenic climate change is under intense scientific dispute as the apocalyptic predictions regarding anthropogenic climate change are based on simulations of the IPCC’s computer climate models, which so far have not demonstrated a high level of accuracy’ (p83). According to the IPCC (2014), the earth is experiencing an unprecedented rise in global temperatures, however not all studies agree with this. Esper *et al.* (2012) for instance provide evidence that ‘during Roman and Medieval times there was substantial warmth which was larger in extent and longer in duration than 20<sup>th</sup> century warmth’ (p1). Another study has found that temperatures in the Antarctic Peninsula began rising naturally 600 years ago, long before any possible man-made impact on the climate (Mulvaney *et al.*, 2012, cited in: Shani & Arad, 2014, p83).

Despite the overwhelming consensus among leading scientists, anthropogenic climate change dissenters make it even more important that ESD is properly defined and implemented in democratic educational systems. ESD is not simply an indoctrinatory tool to utilise in order to focus on anthropogenic climate change – although I believe this forms a substantial element of the ‘environmental crisis’ – it is a means to concentrate upon and tackle the larger concept of the ‘environmental crisis’ from a number of different perspectives. Even climate change sceptics can appreciate the fact that we are dealing with finite resources, that the population is growing leading to further resource stress and environmental degradation and that all of this is taking place in an inequitable global society. On the one hand the IPCC have provided a growing scientific consensus of the significant risks posed by anthropogenic climate interference (IPCC, 2007, 2014).

However, although the scientific consensus increases with each Assessment Report, there are still those that remain unconvinced. At the other extreme, dissenters are described as ‘those who deny it are the flat-earthers of the 21<sup>st</sup> century’ (BBC, 2006, cited in Whitmarsh, 2011, p690). The views are wide-ranging, and among the discourse of consensus to denial, are also the alarmists who focus on the apocalyptic scenarios unchecked climate change could cause (O’Neill & Nicholson-Cole, 2009). Research by Whitmarsh *et al.*, (2005, 2010), established that climate science political sources, and government campaigns, are likely to cause considerable distrust meaning trusted sources of information are required to highlight the benefits of low-carbon living. Furthermore, information needs to be tailored to certain audiences’ values and beliefs (Whitmarsh, *et al.*, 2005, 2010).

Whilst climate change may be a good starting point to start to inform students about the environmental crisis, it is critical to ensure that other elements that constitute ESD are not overlooked. The Sustainable Development Goals (SDG) can also be another important tool to include within an arsenal of ESD student engagement methodologies. Furthermore, it is not only the ‘hooks’ to connect ESD to the curriculum that needs to be considered but also the strategies required to successfully utilise these ‘hooks’. The debate about curriculum reorientation for embedding ESD includes many different strategies for embedding ESD in the curriculum, including,

the design of appropriate interdisciplinary problem-based learning (PBL) challenges that incorporate multi-stakeholder scenarios and conflicts of interest, span disciplinary boundaries and are focussed on skills and an approach to problem solving rather than on the students learning theory as content (Dobson & Tomkinson, 2012, p264).

The SDGs are a valuable tool in PBL because the goals are good starting points to generate discussion and debate amongst students because ‘rather than learning from an expert, the students become the “experts” in the scenario that they are investigating’ (Dobson & Tomkinson, 2012, p267). Debating the usefulness or otherwise of the SDGs, ‘encourages creative thinking by students instead of simply seeking to replicate a “model” answer’ (Dobson & Tomkinson, 2012, p267). Problem based learning can also be used for interdisciplinary working because ‘students studying different disciplines learn different ways of thinking and communicating. Learning to co-operate across disciplinary boundaries means recognising these differences and finding strategies to work together

effectively (Dobson & Tomkinson, 2012, p268). This approach may work well in HE settings, and there is no reason why it could not also be successful in FE. However, I do know from experience that ‘co-operating across disciplinary boundaries’ and interdisciplinary projects are not common in Scottish colleges and as such the chosen research methodology here was often constrained by the confines of Scottish FE. These confines include the multi stakeholders such as Education Scotland, the SFC and Colleges Scotland and the constant micromanagement which colleges do not choose to step outside of.

Pedagogies for ESD are oftentimes problem based to stimulate students to think critically, debate and analyse which leads to participatory learning. To achieve this, ‘in practice, it is relatively simple to initiate projects which address key sustainability issues but these tend to engage minority groups, failing to reach the core of staff, students and stakeholders or indeed influence the culture of the institutions (Tilbury, 2012, p2). *The Future Fit Framework* (2012), devised by Sterling, is an introductory guide to *teaching and learning* specifically for sustainability in HE. It states that ‘In a nutshell – sustainability education prepares people to cope with, manage and shape social economic and ecological conditions characterised by change, uncertainty, risk and complexity’ (p9). Whilst the same requirement is evident in FE there are no similar frameworks being devised for the sector and little evidence of HE guidance being translated or adopted either.

Furthermore, sustainability is underpinned by democratic and participatory processes of change; cross-departmental (and faculty) teaching and research; as well as a redefinition of the teacher student, the leader-employee and the academia-community relationships. In other words, the transformation of a university towards sustainable development requires a realignment of all its activities with a critically reflective paradigm which also supports the construction of more sustainable futures (Tilbury, 2012 p2).

However, Tilbury (2012) is of the opinion this is not also being achieved on the scale required in HE, and to reiterate my point, what is fit for purpose for HE is not automatically suitable for FE, and Scottish colleges are probably even further away from this requirement than universities.

It is not only the tools for ESD implementation that have generated significant debate, there has also been considerable attention given towards ‘the development of criteria,



indicators and instruments’ (Lambrechts, 2015, p802). The variety of approaches for sustainability indicators in HE globally is wide and varied, such as People and Planet’s Green League, the Assessment Instrument for Sustainability in Higher Education and the Sustainability Tracking, Assessment and Rating System. However, even where there are such sustainability assessment initiatives in the UK, they are not utilised in Scottish colleges. Furthermore, ‘while these international declarations provide visible commitment to encourage progress, they are not sufficient to change institutional and disciplinary practices in higher education’ (Bekessy *et al.*, 2007, p308). Tilbury (2012) advised that it is government support combined with the reach of international partnerships (such as the International Association of Universities, the Global Higher Education for Sustainability Partnerships, the Pacific Network of Island Universities, the Copernicus Alliance and Global University Network for Innovation) ‘that are playing a critical role in promoting the innovation needed to reorient higher education towards sustainability’ (p4). However, there are no comparable initiatives for these at FE level in the UK.

### **From Agenda 21 to the United Nations Decade of Education for Sustainable Development**

It is widely agreed that education is the most effective means that society possesses for confronting the challenges of the future. Education, to be certain, is not the whole answer to every problem. But education, in its broadest sense, must be a vital part of all efforts to imagine and create new relations among people and to foster greater respect for the needs of the environment. (UNESCO 1998, p. 15)

The ‘environmental crisis’ has long been recognised (Schumacher, 1973) in one form or another, whether as 1970s concerns about acid rain and pollution, or through identifying negative human impacts on biodiversity using the most sophisticated contemporary big data models. Early concern tended to focus on ecological sustainability, as highlighted by the World Conservation Strategy which stated: ‘a new ethic, embracing plants and animals as well as people is required for human societies to live in harmony with the natural world on which they depend for survival and well-being. The long-term task of environmental education is to foster or reinforce attitudes and behaviours compatible with this new ethic’ (IUCN-UNEP-WWF, 1980, Section 13).

The early breakthrough in recognising *education* as a tool for progressing sustainable development at an international level formally started in 1972 with the United Nations Conference on the Human Environment in Stockholm. The resultant Declaration from the

Conference recognised ‘the need for a common outlook and for common principles to inspire and guide the peoples of the world in the preservation and enhancement of the human environment’ (UNEP, n.d.). The Declaration also had 26 Principles and Principle 19 was for the need for environmental education. This was followed by the Belgrade Charter (1975) and the Tbilisi Declaration (1977), which both focused on the important role of environmental education to protect the environment. The United Nations Conference on Environment and Development (1992) – also referred to as the ‘Earth Summit’, followed and at the time was unprecedented for a United Nations conference, both in terms of its scale and the scope of the areas of concern. All of these initiatives served to highlight the importance of education to achieve sustainability goals. When environmental issues were first brought to the public arena, the objectives to resolve them were principally through conservation and were therefore limited to a construction of ecological sustainability that did not link sustainability to wider social and economic factors (Baker, 2006). The original environmental movements of the 1960’s and 1970’s were quite narrowly focused on restoring ecological balance and were probably more idealistic and apolitical than later environmental programmes. Moreover, ‘earlier UN reports had more or less focused on one international problem each (like debt, peace, etc.)’ (Spangenberg *et al.*, 2002, p62). This contrasted with the Brundtland Commission which had the unenviable task of attempting to reconcile two disparaging issues which were increasingly seen as a divide between North and South: environment and development (WCED, 1985). Throughout this period, ecological concerns developed and become more inextricably linked with other issues to harmonise the environmental, social and economic dimensions of human development (United Nations, 1983).

The 1992 United Nations Conference on Environment and Development, or the ‘Earth Summit’, produced *Agenda 21*, which was a non-binding and voluntary internationally agreed action plan on sustainable development. *Agenda 21* was an action plan for organisations, governments, businesses and individuals to implement sustainability initiatives at a local, national and global level. One of the aims of the document of the Earth Summit was to commit countries to promoting environmental sustainability through practice (UNDESA, 1992). This included education and community based projects highlighted by Chapter 36 ‘Promoting education, public awareness and training’ which was one of few chapters that was uncontentious in that ‘both countries from the North and the South agreed that education was critical for promoting sustainable development and increasing the capacity of the people to address environment and development issues’ (Tilbury *et al.*, 2002, p7). However, it was not until four years later, in 1996, that Chapter

36 of *Agenda 21* was considered by the Commission on Sustainable Development. At that time, it was concluded that ‘in order to change unsustainable production and consumption patterns and lifestyles, it is essential to give great emphasis to the role of education for sustainable development, including environmental economics as well as environmental awareness’ (UNESCO-UNEP, 1996, p2). *Agenda 21* was a milestone moment in sustainable development because it spotlighted education as one of the chief areas through which change could be secured.

In 2002 the Johannesburg Summit broadened the remit of *Agenda 21* – which had inclined to focus education on development that respected the natural environment – to include the process of ‘orienting and re-orienting education in order to foster values and attitudes of respect for the environment to encompass social justice and the fight against poverty as key principles of development that is sustainable’ (UNESCO, 2006, p9). This was significant because it marked the increasingly important understanding of the connectivity between sustainability and economics. In the UK context evaluation of ESD after *Agenda 21* suggested that most projects had just been ‘an extension of environmental education and geography teachers in England shoulder much of the responsibility for ‘delivering’ environmental education and education for sustainable development in a national curriculum context’ (Reid, 2002, p36). Another criticism related to the long-term argument of definition that ‘until there is clarity about what is meant by ESD and recognition that it is about a long-term learning process, there is a danger it will be reduced to environmental management indicators rather than empowering people to be responsible and active global citizens’ (Bourn, 2005, p235). To overcome these and other issues more robust policy guidance was required. It would appear then that over this period of time there was a growing awareness that sustainable development needs to have education at its core and it is an intergenerational task which will not be implemented quickly. It was also a period of optimism, following the implosion of the Soviet Union and the end of the cold war, and a new era where world leaders shared a political will to work together for the future (Spangenberg *et al.*, 2002).

In December 2002 the UN General Assembly adopted resolution 57/254 stating it would implement a UN Decade of Education for Sustainable Development (DESD) lasting from 2005 to 2014 which would be led by UNESCO. The vision of the DESD was that there should be ‘education for all’ as part of a programme for social justice and UNESCO also highlighted that this would mean changing national education policies in industrialised countries (Bourn, 2005, p234). The United Nations General Assembly put in place the

DESD and UNESCO developed the *International Implementation Scheme of the UN Decade of Education for Sustainable Development (2005-2014)*. The objective of the *International Implementation Scheme* was to strategically document a broad framework for all partners that would contribute to the Decade. UNESCO (2005) stated that:

The overall goal of the Decade is to integrate the values inherent to sustainable development into all aspects of learning to encourage changes in behaviour that allow for a more sustainable and just society for all. This goal is articulated around five objectives which are to:

1. Give an enhanced profile to the central role of education and learning in the common pursuit of sustainable development;
2. Facilitate links and networking, exchange and interaction among stakeholders in ESD;
3. Provide a space and opportunity for refining and promoting the vision of, and transition to sustainable development – through all forms of learning and public awareness;
4. Foster increased quality of teaching and learning in education for sustainable development;
5. Develop strategies at every level to strengthen capacity in ESD (p1).

This was a call to national education systems and Scotland responded accordingly by the Scottish Executive producing *Learning for our Future* (2006). This was against the backdrop of post devolution Scotland, where there was a cross party optimistic consensus, right across the political spectrum, that the newly self-governing Scotland could be a beacon of small nation sustainability. This was a period of new confidence and all parties were in favour of Scotland being a sustainable nation, particularly as Scotland has a long history of civic education. Furthermore, in light of the success of education for citizenship in Scotland, ESD was seen as the next logical stage in the transition to becoming a sustainable nation because citizenship education wanted to move forward to promote democracy, social cohesion and the environment (Peters *et al.*, 2008).

### **Education for Sustainable Development in Scottish Education**

Scottish educational policy has ostensibly accorded priority to education and the environment for over 40 years. This is evident as early as *Environmental Education*

(1974), a document produced by Her Majesty's Inspectorate of Schools, which aspired to integrate environmental education across subjects such as history, geography and social studies. However, it proved to be ahead of its time and 'failed to affect education policy in the formal sector because:

- the political system had as yet no pressing need to support the initiative;
- the grassroots base necessary to promote it within educational administrations was underdeveloped; and
- the education administration had more pressing priorities in the form of major reorganisation' (Lavery & Smyth, 2003, p368).

Unfortunately owing to a combination of major changes in educational structure and prolonged political ambivalence, the recommendations of this document were not implemented, and it did not influence Scottish school education to any significant degree. However, it did have an important impact upon 'subsequent developments outside the political system, both at home and abroad' (Lavery & Smyth, 2003, p368). One lost opportunity was the failure on the part of the Scottish Office Education Department to accept an invitation to be part of a government delegation at the International Conference on Environmental Education at Tbilisi in 1977. Unfortunately, the invitation was not accepted, 'which may have been indicative of how ESD – *or environmental education* – was considered in Scottish educational policy' at the time (Lavery & Smyth, 2003, p368, italics mine). Although *Environmental Education* (1974) was not implemented it reflects government policy on environmental education at the time. Furthermore, some of the report's recommendations were unofficially put into practice by the Strathclyde Environmental Education Group. This was an informal group from across the educational spectrum, such as teachers, teacher educators, local authority advisors, academics and HM Inspectors. The importance of this group was in the range of disciplines they covered from science, social science and the arts, recognising the importance of interdisciplinary and transdisciplinary methods for successful environmental education (Lavery & Smyth, 2003).

By 1990 a government working group was formed to implement ESD in all aspects of Scottish education. This working group was chaired by Professor John Smyth (1924 - 2005) who had been a key influence of the educational element of *Agenda 21*. Moving forward, this working group was also quick to respond to the wider prospectus of the United Nations Conference on Environment and Development (UNCED) Earth Summit in

Rio de Janeiro in 1992 which had resulted in *Agenda 21*. The document *Learning for Life* (SoEnd, 1993), prepared for the Secretary of State for Scotland, focused on Chapter 36 of *Agenda 21* which related specifically to education and which was of course internationally influenced by Professor John Smyth. *Learning for Life* contained recommendations on how to progress sustainability through educational policy in Scotland to ‘alert everyone to the importance of the environment in daily life and also to its vulnerability (SoEnd, 1993, p69). If it had been implemented Scotland could have been at the forefront of environmental and sustainability education in response to *Agenda 21*, which would have placed it ahead of other countries in the UK and on a level with countries such as New Zealand and the Netherlands (McNaughton, 2007). However, at this time, Scottish colleges had received increased autonomy – which will be discussed later – and as a result, could decide the educational priorities with which they wished to engage. This did not at the time include sustainability.

After a promising start, the progress of environmental education across Scottish education seemed to stall from 1993 onwards. This was partly due to concern about the standards of core skills such as numeracy and literacy in education, not just in Scotland but the UK as a whole, which led to policies focusing on essential core activities and side-lined seemingly non-essential activities such as ESD (Lavery & Smyth, 2003). I believe the lack of focus on ESD or sustainable development in Scottish FE at this time was as a result of the Further and Higher Education (Scotland) Act 1992, which made colleges independent of Local Authorities and limited governance. Colleges were told ‘to be free, independent and create their own future’ (Scottish Government, 2012) and without policy to ensure sustainable development was prioritised it simply did not exist on many college agendas.

This factor may also have impeded ESD progress in recent times in Scottish FE. Certainly from the mid 1990’s onwards, ESD was routinely considered a ‘fringe’ issue in education, and UK educational policy concentrated on exam results, league tables and a return to basics such as literacy and numeracy (Borradaile, 2004). This resulted in the progress made previously in Scotland in environmental education, which had placed it ahead of the rest of the UK, largely being lost and the position in 2003 was ‘that Scotland, in spite of advantages of size, good governance, an early start and a political and public climate favourable to sustainable development, failed to establish an education system re-orientated to it of the kind called for in *Agenda 21*’ (Lavery & Smyth, 2003, p378). Another hindrance at this time may have been attributable to the ambiguity of defining sustainable development. Smyth (1995, p11) noted ‘that these ambiguities provoke

objections from the policy makers in both industrialised and developing countries who suspect that it represents a ‘green’ attempt to get away from development, or that it disguises what is to be sustained, namely a ‘northern’ affluent lifestyle’. Payne (2016) believes environmental education and ESD has over time been negatively impacted by a:

stealth revolution of neoliberalism ... which put simply, increasingly, global economic imperatives instrumentally determine the (Nation and Global) State (and its policies, curriculum, etc.) while the allegedly “sovereign/autonomous” Nation State now struggles to even partially manage its own economy and derivative, often regressive, social and environmental arrangements and formations (p71).

Creeping neoliberalism and a down-turn in the economy may have effectively turned ESD into a luxury which cannot be afforded in the public sector, set against a backdrop of ‘insatiable levels of consumerism in the global North and amongst elites in the global South’ (Selby & Kagawa, 2015).

From *Environmental Education* (1974) and *Learning for Life* (1993) onwards, subsequent environmental educational policy in Scotland has also been difficult to execute fully for similar reasons, one problem in particular being that ‘most initiatives are sponsored by one government department but the recommendations made need to be implemented by another’ (Lavery & Smyth, 2003, p373). For example, *Scotland the Sustainable: the learning process* (1999) was sponsored by the Scottish Office Agriculture, Environment and Fisheries Department but proved to be unworkable as recommendations were for the Scottish Office Education and Industry Department. The fact that there are numerous agencies involved remains a problem for ESD in Scotland because currently ‘there is no single centralised unit aware of all ESD activity, and so it becomes difficult to know what is already available in the sector and where gaps may lie’ (Higgins & Woodgate, 2012, p14). This remains a chronic problem because ‘responsibility for policy formulation on sustainable development is often shared across several government departments which in practice leads to a narrow focus and ‘silo’ approach and also leads to less commitment to its implementation and a lack of coherence in policy’ (UNESCO, 2013, p20).

Whilst it can be acknowledged that there may not have been direct opposition from government to embedding ESD in education, as has been shown above it has often been side-lined by other priorities or because the timing was wrong. This is a situation that needs to change to ensure ESD is at the forefront of environmental educational policy, and

it could be that the time is now right for this realignment. It is just not enough for sustainable development to be supported by educational policy alone as such support does not necessarily mean that embedding ESD in all levels of education will automatically follow, which has historically been the case in Scottish education (Lavery & Smyth, 2003). On a more positive note it could be argued that recently ‘the educational response has indeed grown and developed but the rate of environmental change is growing faster’ (Smyth, 2006, p248). The educational response at this time, at a time of optimism in Scotland in response to the UNDESD, is evident in *Learning for our Future* (2006), produced by the Scottish Executive. This was an optimistic time in Scottish politics, however this would not last as the global financial downturn was about to strike.

It was of course not all negative during the period (1990-2005) and there were positive outcomes in relation to ESD in Scottish education during this time also. The Eco-schools programme was developed in 1994 by the Foundation for Environmental Education and was implemented in Scotland in 1995. This programme has proven to be extremely successful in Scotland to date with nearly 100% of Scotland’s Local Authority primary schools taking part. It was also during this period that major curriculum reform was underway, eventually resulting in *A Curriculum for Excellence* which was introduced in 2010 and which ‘embraces all formal and non-formal learning between the ages of 3 and 18 and ESD permeates both within and across each discipline’ (Higgins & Woodgate, 2012, p18). Whilst Higgins and Woodgate (2012) state that ‘ESD permeates both within and across each discipline in learning for 3 to 18 year olds’ (p18), I would suggest that successful realisation of the aim in *A Curriculum for Excellence* is intermittent across all of Scottish education with some levels being more successful than others. This is evidenced by Humes (2013) who reported in relation to *Curriculum for Excellence* that ‘it is evident that a great deal of thoughtful work has been undertaken in primary and secondary schools across Scotland, though the response from primary schools seems to have been stronger’ (p84). Also, research by Priestley and Minty (2012) determined that ‘there was a general consensus among the interviewees, both primary and secondary, that primary schools were further ahead in the implementation of *Curriculum for Excellence*’ (p3). In my opinion, the situation in FE in terms of *Curriculum for Excellence* success, is more likely to be similar to that of secondary education than primary education.

School education in Scotland has nevertheless made significant progress in embedding ESD in the curriculum. There is still room for improvement however, since Eco-Schools involvement is voluntary and *A Curriculum for Excellence* where it embraces ESD at secondary level still focuses heavily on specific subjects such as science and social



subjects (Higgins & Woodgate, 2012). In terms of embedding ESD in the curriculum, and the integration and alignment of policy and practice in FE, the overall picture is still more sporadic. I believe this is a consequence of several recent factors such as the Post 16 Education Bill and subsequent college mergers that will be discussed later. To overcome the resultant obstacles this research project aims to link theory and practice, since established case studies looking at ESD tend to not only distinguish between primary and higher education but also between theories and practice (Kopnina, 2012).

In the 1990s there is evidence of an overall lack of political will in ESD in Scotland as it would appear the commendable intentions were not sufficiently robust to overcome administrative failures and conflicts of interest in the system (Lavery & Smyth, 2003). During this time ‘the SDE agenda was not politically important enough to withstand the pressures put on it by major political initiatives such as the standards in schools’ agenda or the reorganisation of local government’ (Lavery & Smyth, 2003, p378). By the end of the 1990s the whole political culture of Scotland had been transformed by devolution and the coming of the Scottish Parliament. Scotland now had autonomy for education in its entirety, so there was no hiding place any more behind a Westminster Government. The change to the political system in Scotland at that time meant there was greater potential to address environmental and sustainable development issues nationally, which is evident from progress already discussed in ESD at the school’s level during the decade following the implementation of the Scottish Parliament. Furthermore, ‘the Scottish Government has made a substantial commitment to the UN Decade of Education for Sustainable Development’ (Martin *et al.*, 2013, p1529), also during this period. There is evidence that the progression of ESD has benefitted from the Scottish Government, in comparison with the rest of the United Kingdom. Martin *et al.*, (2013) reported that in England and Northern Ireland, and also Wales but to a lesser extent, government and policy emphasis on sustainability and ESD has diminished, however ‘the exception is Scotland where the devolved government has placed a much greater emphasis on social equity and the environment as key policy target’ (p1536).

Moving forward to the present day, there may indeed still be ground for qualified optimism. Education Scotland claims to have sustainability high on its agenda as evidenced by their Inspection Advice Note 2014-15, which advises that programmes and courses at all stages should have cross-cutting themes such as sustainability and citizenship, including global citizenship (Education Scotland, online 13 June 2014). However Scottish colleges are only formally inspected around once every four years, so

ESD progression is not necessarily monitored any more frequently than this. Also, there is the danger that if ESD is only being considered because it is monitored, it is less likely to be accepted and engaged with fully by staff, and therefore is likely to make little appreciable difference compared with what might be possible if staff and institutions were fully committed to it.

While Forster (2006) found that institutional strategies in tertiary education in Scotland showed little commitment to embedding sustainability across the curriculum, by 2009 Ryan (2009) noted that some progress had been made in higher education and there had been positive responses at strategic levels designed to prioritise increased pedagogic development in ESD, which also appeared to be intensifying. It would therefore seem that policy, theory and practice regarding ESD were in the same period becoming better integrated within *universities* where it was becoming common to acknowledge that ‘a university education should prepare graduates for the needs of a green economy’ (Luna *et al.*, 2012, p7). Furthermore, in the same period, and staying with the theme of using ESD to address the green economy, the One Planet Schools Working Group claimed that ‘an estimated 130,000 jobs will be created in Scotland by 2020 as Scotland strives to create a low carbon, equitable, sustainable nation by moving toward a successful low carbon economy’ (One Planet Schools Working Group, 2012, p13). It would appear that universities have been able to respond more productively than colleges to this agenda, perhaps because of its strong links to big science and big technology in universities themselves. The Higher Education Academy (HEA) also acknowledged that in order for universities to promote sustainability and the green economy effectively they will also need to redesign the curriculum (Luna *et al.*, 2012). ‘A university education should prepare graduates for the needs of a green economy, working with further education, which also has a key role’ (Luna *et al.*, 2012, p7). The problem with focusing on the high tech developments of the green economy as universities seem to have done is that it may dilute the overall ESD message, which is bigger and far more meaningful than *just* technological and industrial development. Universities have a bigger stake to develop new technologies than colleges, as generally this is not the remit of colleges, which may go some way towards explaining why universities have engaged with ESD more in relation to the green economy requirements. In addition, these initiatives in HE, even if only modest in their progression, appear not to have influenced significantly the emergence of any similar guidance or patterns of strategic policy making in Scotland’s Colleges. However, any progression in HE only serves to highlight the lack of parallel progress in FE colleges, where the absence of formal guidelines looks like an increasingly reprehensible omission.

Across all sectors, care of course needs to be taken that the focus is not unduly on the economic strand of ESD, but rather on a genuine integration of all three elements. UK and increasingly Scottish economic policy often links environmental education to the green economy (Luna *et al.*, 2012), but we must recognise that ESD as a concept is about much more than green economics. This should nowhere be more obvious than in the curriculum itself. However, the One Planet Working Group (2012) reported that ‘the Scottish Qualifications Authority has an important role to play in supporting Scotland’s capacity to develop the necessary understanding and skills to take advantage of emerging opportunities in a future low-carbon economy’ (p23). Indicating that the link again between the curriculum and the economy is key. However, I do not think this is indicative of ESD in Scotland in general because the Scottish government itself acknowledged that ‘Scotland has a distinguished history and international reputation recognised by UNESCO and others for sustainable development education, global citizenship and outdoor learning, which are firmly embedded within *A Curriculum for Excellence*’ (Scottish Government, 2013, p3). Which indicates sustainable development is about much more than just a green economy.

Regardless of the level of education to which ESD is being applied it is important that policymakers are consulting with the educators or practitioners to ensure that any policy produced is fit for purpose. This enables proper consideration to be given of the expectations and the anxieties of educators in relation to the delivery of ESD. This does not appear to be happening at the present time. Promoting and assimilating ESD discourses is an on-going struggle and such discourses, even where audible, do not signify a unified sectoral voice, since the participants involved are largely policymakers and external academics, to the exclusion of front-line practitioners (Stevenson, 2007). In light of recent changes in the Scottish college sector, however, we may now be at an interesting crossroads where policy, theory and practice can be better aligned than ever before, making the time right for change. It is against this backdrop that the research in this thesis aims to link and understand the relationship between theory, policy and practice wherever possible.

### **Recent Changes in the Scottish College Sector**

Reforms of the scale on which we are embarked must have a clear overriding purpose. To that end, we are clear that meeting the needs of the learner is at the heart of all our proposals. Scotland’s ability to flourish as a nation is dependent on

its people and I am committed to ensuring that we help maximise each individual's potential. To achieve these aims, I am working towards bringing legislation forward in the second half of next year which will underpin and facilitate our plans (Scottish Government, 2011, p5).

Over the last few years there have been many changes in Scotland's colleges. The most significant of which emerged from the Post-16 Education (Scotland) Bill (2012) which resulted in the sector moves across Scotland to create a new regional college structure. More recently the *Commission for Developing Scotland's Young Workforce* (2014), known as and hereafter referred to as the 'Wood Report' is influencing Scottish college and vocational learning and teaching.

These recent changes began with consultation paper *Putting Learners at the Centre* published by the Scottish Government in 2011. This consultation paper acknowledged that the Scottish Government had 'made clear its primary purpose is to achieve sustainable economic growth whilst recognising the difficult economic circumstances we face, with unemployment, and youth unemployment, in particular, significantly higher than pre-recession levels' (Scottish Government, 2011, p6). This pre legislative paper stated that fundamental change was needed for the Scottish college sector and set out ambitious steps for achieving this. These steps included,

asking the Scottish Funding Council (SFC) to allocate its resources to meet the needs of regions, identify national provision and resource it to meet national needs, put new expectations on colleges to plan their courses to prepare students for careers in industries where there will be a good chance of them getting a job and focus funding on nationally recognised qualifications and units (Scottish Government, 2011, p33).

To implement these steps, it needed to be determined if the current systems and structures were adequate and also to take into account work started by the SFC which identified scope for greater efficiencies and improvements to college provision (Scottish Government, 2011). The consultation also documented the fact that colleges in close proximity to each other were often competing for the same regional students by running similar courses causing unnecessary duplication and competition (Scottish Government, 2011).

As a result of this consultation paper, it was determined that further research was required to establish how the Scottish FE sector as a whole should be managed and how each college or entity should be governed. One of the suggestions of *Putting Learners at the Centre* (2011) was a regional model for the FE sector which the *Report of the Review of Further Education Governance in Scotland* (2012) conducted by Professor Russel Griggs OBE supported. Recent mergers – at that time – by Adam Smith and Forth Valley Colleges served to confirm that ‘consolidation and the creation of larger more efficient colleges could sustain services to students whilst saving money also’ (Scottish Government, 2011, p43). The *Report of the Review of Further Education Governance in Scotland* established there had been little change in the governance structure of Scottish FE since 1992 and the structure had been set up as a Scottish parallel to the Further and Higher Education Act 1992 in England and Wales. The Further and Higher Education (Scotland) Act 1992 ‘backed colleges out of the Local Authorities they were part of, made them independent entities with charitable status, gave them some governance requirements by statute, and then told them to be free, independent and create their own future’ (Scottish Government, 2012). After analysing *Putting Learners at the Centre* and the *Report of the Review of Further Education Governance in Scotland* it seems clear that the previous autonomy, freedom and strategic independence enjoyed by the colleges were no longer to continue. Scottish Government had clearly taken the view that extensive rationalisation and centralisation would reform the sector in terms consistent with its overall economic and educational planning for the nation.

As a result of these consultations and reports, the Post-16 Education (Scotland) Bill 2012 came into force with the biggest change being the merger of Scottish colleges. There were at this time 37 Boards of Management with a further four colleges not incorporated in statute, like the others, but still publicly funded. This meant there were 41 separate publicly funded college entities and it was suggested ‘there also has been no real national direction or policy from Government for many years which can provide the overall guidance and principles that the sector needs, and with 41 different College Boards it has been difficult to establish any real cohesive engagement between Government and the sector as a whole’ (Scottish Government, 2012, p3). To address this ‘more clarity needed to be provided to Boards with given outcomes of what is expected of them which would be audited to measure success’ (Scottish Government, 2012, p4). To achieve successful outcomes, it was recommended that new Chairs and Boards were recruited and appointed to manage the new regions (Scottish Government, 2012). For this to operate other considerations had to be addressed, including, to achieve successful outcomes:

- National guidelines and policies need to be in place consistently across Scotland.
- How the College sector should be strategically managed at a national level?
- How the sector should be funded?
- How we move to a more national set of terms and conditions for staff (Scottish Government, 2012, p6).

One response which could help address these and other issues was to establish ‘a central resource within Scottish Government that works with Colleges to deliver major capital projects for the FE Sector’ (Scottish Government, 2012, p7).

The college sector regionalisation programme therefore merged 41 individual institutions into 13 regional college institutions. This meant senior management within the college sector could be streamlined because resource efficiency meant staff at this level would now only be required for 25 colleges (excluding Newbattle Abbey College and Scotland’s Rural College). As the parallel and ongoing drive to formalise ESD within the colleges required the strategic leadership of management at a senior level endeavouring to implement the Scottish ESD College Project effectively against this political background was extremely challenging – and trying to engage with staff at such an extremely unsettling time proved very difficult. As confirmed to me by one college Principal, ESD in principle should be embedded within the curriculum but in reality it is ‘an additional nicety to have when there are no other difficult decisions to make such as staff redundancies’ (Personal conversation, 2013). A further result of the Post-16 Education (Scotland) Bill (2012) and joint consultation between the Scottish Funding Council (SFC) and the Scottish Government was that ‘a radically different approach to funding learning provision in colleges was introduced’ (SFC, 2012, p9). From academic year 2012-13, funding to colleges was based on the social and economic needs of the region in which the college operated and was provided to a regional body rather than the college itself (SFC, 2012, p9). Allocating the funds to regions meant that course provision would be considered at a regional level thereby supposedly eliminating repetition of courses by colleges within the region and reducing staff numbers across relevant curriculum departments. The turbulence that descended upon the sector as a result of the changes cannot be overstated. On the one hand, government policy was needed to reduce unnecessary repetition and spending nationally across the sector, however at an individual college level this was understandably difficult to reconcile to staff and the effects of the mergers were dramatic.

Nevertheless, after a very unsettling time for Scotland's colleges, the sector regionalisation has been completed and it is to be hoped that ESD can at last come to the forefront of curriculum provision. New possibilities have been identified in *The Economic Impact of Scotland's Colleges* (2014), a report produced by Colleges Scotland. This report identified areas of the curriculum as growth sectors where ESD could be implemented: for example, energy (including renewables), food and drink (including agriculture and fisheries), life sciences and sustainable tourism (Colleges Scotland, 2014, p5). In order to deliver skilled workers in these growth industries 'colleges need to work in partnership with employers to deliver skills and training as 39% of college enrolments in Scotland are linked to industry and colleges are Scotland's key provider of skills' (Colleges Scotland, 2014, p4). The Wood Report (2013) further stated that 'Scotland has the potential to secure a highly educated, skilled and well-motivated young workforce' (p4) but although 'Scotland has deservedly an acclaimed higher education sector we must move on from our ingrained and frankly ill-informed culture that somehow vocational education is an inferior option' (Scottish Government, 2013, p5). 'The college sector is the largest provider of lifelong learning and career development for adults in Scotland' (Colleges Scotland, 2014, p3), and this must surely be one of the chief reasons for ESD assuming priority in the curriculum at this level instead of being confined to its attenuated position in university education. Furthermore 'one in five of young HE students in Scotland are college students' (Scottish Government, 2013, p10), which serves to underline the locus of the sector in providing both FE and HE learning for a large percentage of Scotland's workforce. In other words, the potential impact of an ESD sensitive college curriculum on Scottish society could be immense.

Recommendations 4 and 5 of the Wood Report state that 'colleges' key role in the development of Scotland's young workforce should be recognised and managed through Regional Outcome Agreements' and 'the new regional colleges should have a focus on employment outcomes and supporting local economic development' (Scottish Government, 2014, p10). Therefore, it makes sense to include ESD within college curriculums particularly where the curriculum is feeding into the growth sector areas already highlighted. 'Scotland requires 'a skilled workforce and a high quality intermediate vocational education and training system which complements our world-class higher education system' ... in order to have 'good prospects for sustainable economic growth' (Scottish Government, 2012, p74). Sustainable economic growth is only one part of ESD and it is important that this is not considered important independently of the overall aim of ESD, however if it is utilised as an employability starting point it may be the

catalyst that is required to kick-start the effective implementation of ESD across the entire college curriculum.

Outwith campus management, there is however conflicting evidence that curriculum initiatives for sustainable development have received any more attention than they have in extracurricular activities (Hopkinson *et al.* 2008). Indeed, some studies indicate that ESD has not been incorporated within curricula to any great extent at all (Forster, 2006). Where sustainability *has* been fully embraced, colleges and universities have included the wider community, employers and students, and have linked sustainability to the management of estates and to the curriculum (Forster, 2006). It is increasingly evident that the concept of including ESD in tertiary education as a mechanism for achieving sustainability has been in principle recognised; however, this is still sporadic and difficult to evidence across the FE sector as a whole in Scotland.

Research proves that this is not only an issue in Scotland but also globally. This is demonstrated in recent studies that have found that sustainability has made progress in higher education in campus operation and strategic planning, and in principles of sustainability imprinting formal university policy. However much less is known about the integration of sustainability into university curricula (Savelyeva & McKenna, 2011). For example, in Canadian universities, the sustainability categories that are most often evaluated include emissions, waste, recycling, green buildings, transport and water, with areas such as human rights and society often being overlooked (Fonseca *et al.*, 2011). A study by Emanuel and Adams (2011) looked at students' perceptions of campus sustainability in Hawaii and Alabama, and found students focused on practical answers to sustainability issues such as recycling, but the study noted that only 27% of Alabama students and 10% of Hawaii students thought environmental education should be included within the curriculum.

'The majority of the universities engaged with sustainability are preoccupied with the greening of the campus' (Tilbury, 2011, p21). This claim is borne out in journals of higher education and university websites, where there are numerous instances relating to waste, recycling, energy consumption and sustainable goods etc. Then there are also schemes such as ISO 14001. However, these initiatives rarely have an impact on teaching and learning through the formal curriculum (Tilbury, 2011). These realities suggest that while university education is ahead of college education in some key policy respects, it faces many similar challenges in ensuring that ESD is impacting on learning and teaching.



## **Barriers to embedding Education for Sustainable Development in the Curriculum**

There has been a great deal of research into the many barriers to initiatives which seek to support ESD learning and teaching, both in the curriculum and by the use of extra-curricular activities in tertiary education. The barriers identified include lack of time and space in the curriculum, lack of staff confidence to engage with ESD, perceived irrelevance of ESD to subject and limited resources and commitment (Cotton & Winter, 2010; Scott & Gough, 2004; Dawe *et al.* 2005; Lipscombe, 2008). It should be acknowledged that the research highlighting these barriers has taken place chiefly in HE, but the barriers apply equally to FE also. ESD has also proven to be contentious for reasons such as indifference and resistance from some vested interests, attributed by some authorities to the belief that imposing it upon institutions removes their academic freedom (Knight, 2005).

Lack of staff confidence in environmental education is not confined to the UK. Research in Cyprus has also found that school principals and teachers in general do not feel confident and are poorly equipped to lead and deliver ESD within their institutions (Zachariou *et al.*, 2012). With the appropriate support however, from an experienced ESD practitioner they felt more confident to include ESD within their teaching. Given that the ESD practitioner will not necessarily be experienced in the area of the curriculum on which they are advising, it is just as important that there is *collaboration* between the ESD practitioner, the subject lecturer and where relevant, also the student. This will help provide teaching staff with the knowledge and skills to make obvious links, therefore not overcrowding the curriculum to an even greater extent, which is another key concern of lecturers. Sterling (2004) believes that sustainable development is ‘not just another issue to be added to an overcrowded curriculum, but a gateway to a different view of curriculum’ (p50). However, ‘framing the sustainability discourse needs to be translated into curriculum and pedagogical practices that will intellectually and emotionally engage students which is by no means a simple or easy task for teachers, however most teachers have not been assisted in this task’ (Stevenson, 2007, p269). A dramatic shift is required in staff development if pedagogical reform is to happen. Existing styles and levels of staff development in ESD are not adequate for the ‘step change’ that is required, especially if as Wals (2010) suggests that ‘at present most of our universities are still leading the way in advancing the kind of thinking, teaching and research that only accelerates unsustainability’ (p32).

A further barrier lies in establishing exactly where ESD fits within the curriculum. One recent and interesting suggestion is that sustainability literacy should be ‘co-curriculum’ and studied as a separate entity from the students’ chosen areas of study as additional optional modules (Winter & Cotton, 2012). This research thesis suggests a different approach. I am looking to embed ESD *within* courses incorporating a variety of methods (Hopkinson *et al.*, 2008). My methods include linking ESD to already established elements of the course – for example introducing water conservation when shampooing hair for hairdressing students, or construction students considering the life cycle and embodied carbon of insulation materials. Furthermore, it is possible to combine ESD with core skills learning and teaching such as using numeracy for energy calculations for equipment used by the students as part of their vocational training. I also acknowledge those studies in HE institutions in Scotland which have ‘underlined the point that there is no single ‘model’ for embedding ESD and that diversity in provision and modes of delivery means each institution should develop its own strategic response, but also compare their approaches with others to prompt further innovation’ (Ryan, 2009, p20). The message here is that it is crucial not to discount any approach as it is important to welcome any curricular experiment which accords priority to ESD as a key element of the learner experience.

This research project aims to use a number of approaches and also to compare and contrast what is and is not effective between institutions. The optional module approach is utilised to introduce the concept of sustainability to both staff and students, which I believe will prove a successful technique for introducing sustainability generically. However, embedding sustainability within the curriculum is still the favoured approach because the danger with optional modules is that they could be marginalised in a crowded curriculum. This research also recognises that the ultimate long-term preferred goal, however, is to achieve the ‘preference among students for a reframing of curriculum content rather than additional content or courses’ (Drayson *et al.*, 2012, p4). Whilst an optional module may sometimes be the best option, ‘sustainability challenges the current paradigms, structures as well as predominant practices in higher education ... [and] universities and colleges are facing this reality as they seek to meaningfully contribute to sustainability’ (Tilbury, 2012, p1). Scottish FE needs to also recognise that just like HE if ‘the sector is to be transformative, it needs to transform itself’ (Tilbury, 2012, p1). This means the ‘usual approaches’ such as an optional module must be jettisoned in favour of a mind shift to truly transformative approaches for successful ESD realisation.

In some areas of Scottish education there is definite evidence that an educational response to the environmental challenge *is* developing as anticipated by *A Curriculum for Excellence* (Scottish Executive, 2004). *Curriculum for Excellence* is the Scottish Executive document for curriculum reform for schools in Scotland in the twenty-first century, which aspired to ‘enable all children to develop their capacities as successful learners, confident individuals, responsible citizens and effective contributors to society’ (Scottish Executive, 2004, p3). This major intervention appears to have helped ESD move further up the agenda and progress it in the school curriculum to the point where we can at last make good the fact that Scotland ‘has not been particularly successful in developing environmental and sustainability education since the 1990s’ (McNaughton, 2007, p779). The reform provided by *A Curriculum for Excellence* coupled with the success of a range of environmental initiatives, which is confirmed by the achievement of the Eco-Schools programme in Scottish primary education, is evidence that ESD is certainly developing in primary and secondary education in Scotland, even if progress is slower in secondary education than in primary schools (Humes, 2013). The Eco-Schools movement ‘is an international initiative designed to encourage whole-school action on sustainable development education issues’ which has strengthened ESD in Scotland, particularly in primary education (Keep Scotland Beautiful, 2013). These signs of success at primary and secondary levels now need to be translated into tertiary education, particularly FE.

Further developments in ESD advancement in Scottish education include the One Planet Schools Working Group (2012) recommendation that all learners should have an entitlement to *learning for sustainability*. This recommendation was formally accepted and therefore at some point will be implemented as a formal requirement. Also, ‘in line with the new General Teaching Council (GTC) for Scotland’s Professional Standards, every practitioner, school and education leader should demonstrate learning for sustainability in their practice’ (One Planet Schools Working Group, 2012, p14). The *Standards for Registration: Mandatory Requirements for Registration with the General Teaching Council for Scotland* state that ‘these standards are underpinned by the themes of values, sustainability and leadership’ (GTC Scotland, 2012, p2). Furthermore,

‘Learning for Sustainability’ is a whole-school commitment that helps the school and its wider community develop the knowledge, skills, attitudes, values and practices needed to take decisions that are compatible for a sustainable future in a just and equitable world. Learning for sustainability has been embedded within the Standards for Registration to support teachers in actively embracing and promoting

principles and practices of sustainability in all aspects of their work (GTC Scotland, 2012, p2).

It will be interesting to see how this vision develops and is implemented over time within primary, secondary and tertiary education. The decision of the Scottish Government to rebrand One Planet Schools as a learning for sustainability ministerial task force bodes well for the future. Developments such as these confirm that ESD cannot be treated as an additional requirement within the curriculum that educators can choose to ignore or regard as a luxury that they do not have the time to address. It is important to note that the GTCS has made learning for sustainability a value – and not just an activity – meaning learning for sustainability is now a priority in the Social Justice Professional Value and Personal Commitment theme, which is core to being a teacher and states the requirements for sustainability as ‘embracing locally and globally the educational and social values of sustainability, equality and justice and recognising the rights and responsibilities of future as well as current generations’ (GTC Scotland, 2012, p5). This means that if teachers are not demonstrating this they should not be qualified. It also further emphasises that sustainability is a cross cutting theme of government.

Despite the progress made to date, there is still a distinct lack of research evidence for determining how best to develop and deliver a successful ESD curriculum in further and higher education. This ‘is indicative, perhaps, of the complex nature of sustainable development education’ however, ‘an opportunity exists in Scotland, to add to the body of knowledge through qualitative research linked to sustainable development education curriculum development’ (McNaughton, 2007, p634). More than just research is required, of course, because there is also a need for appropriate materials to be developed and made available to teaching staff since ‘without access to a good, reliable, repertoire of illustrative case histories life for the educator can become difficult, and there is a dearth of suitable material’ (Smyth, 1995, p10). The key driver of my research project is to satisfy these needs.

Lack of formal guidance appears to be a sector wide issue and not one that is just confined to leadership on ESD delivery within FE. A review of FE governance in Scotland established that since 1992 the Scottish Government has not audited the FE sector to determine if it is fit for purpose or has what it requires to fulfil its mission (Griggs, 2012). Colleges have also complained that ‘Government does not make it clear to the sector what is expected of it’ (Griggs, 2012, p20). Taking this into consideration it is not surprising

that concepts which are multi-faceted, fast moving and interdisciplinary, such as sustainable development and ESD, lack clear direction and supervision. Moving beyond the lack of support across the FE sector there is however a specific issue with ESD in that although, to a certain extent ‘most organisations are aware of other connected initiatives; a true picture of ESD in Scotland is difficult to describe and present’ (Higgins & Woodgate, 2012, p20). This may be because there is no single central stakeholder responsible for ESD development, delivery and assessment across all educational levels, which may be necessary for the progression of such a multi-faceted and interdisciplinary concept.

Across the UK, current bespoke ESD provision is predominantly offered within university education as standalone modules, which is evidenced by the courses below.

- The University of Nottingham - FutureLearn course “Sustainability, Society and You” (started January 2014)
- The University of Exeter - Climate Change: Challenges and Solutions (started January 2014)
- The University of Bath - Make an Impact: Sustainability for Professionals (started March 2014)
- The University of Leeds - Fairness and Nature: When Worlds Collide (started February 2014)

All of these courses were offered free as ‘massive open online courses’ (MOOCS) and are available to anyone. However, whilst any course provision is positive, modules such as these are not addressing the fact that we need the employees of tomorrow, such as vocational workers and skilled tradespeople, many of whom will complete their training at college rather than university, to be educated about environmental concerns and how they impact upon their chosen area of employment. Also as standalone university level modules, MOOCS are unlikely to be accessed by many college students.

Another reason why HE often has an added incentive to engage with ESD is because of funding streams. Institutions such as the Higher Education Funding Council for England (HEFCE) require there to be sustainable values shown in funding applications.

*Sustainable Development in Higher Education: HEFCE’s role to date and a framework for its future action* (2014), advises that ‘higher education can contribute to sustainable development’ (p2) and that their policy statements on sustainable development and carbon reduction will influence their funding decisions. Furthermore, according to HEFCE (2014)

‘they have played several important roles in relation to sustainable development by providing funding and co-funding for projects’ (p4) and ‘at the request of Government, much of HEFCE’s funding has been directed towards carbon reduction (p5). Universities also make decisions on areas of research based on the Research Excellence Framework (REF), which,

includes an explicit assessment of the impact that research has had on the environment, as well as on society, the economy, culture, health and quality of life. The assessment will inform the allocation of research funding from 2015; the REF therefore incentivises institutions to demonstrate the impact of their research in sustainable development (HEFCE, 2014, p13).

This entails that institutions providing funding for HE will give grants to projects which have ESD incorporated in them, hence there is a growth of academic interest in ESD because it is expected to enrich HE delivery. Moreover, research excellence is assessed on its impact in furthering sustainable development. These initiatives or incentives do not exist in FE, highlighting again that there are programmes targeting HE, maybe at the expense of FE, which is not provided with the same opportunities.

*The Future Fit Framework* (2012) has already been mentioned as a guide produced for HE, which although currently has not been widely adopted in Scottish FE, could be of use because the ‘educational recommendations [in The Framework] are not prescriptive with respect to sustainability attributes and are more inclined towards general educational outcomes’ (Shephard & Dulgar, 2015, p143). Guidance on general educational outcomes, backed by quality assurance, particularly if issued by Education Scotland or the Scottish Funding Council, is far more likely to be listened to and embraced by Scottish FE. ESD guidance produced by the Higher Education Academy and the Quality Assurance Agency for UK HE providers’ states that ‘[HE} students may already be familiar with education for sustainable development through secondary and further education, though not necessarily encountered it by that name’ (HEA/QAA, 2014, p6). *Again* there is the distinction between HE and FE, *again* the guidance is for HE, *again* there is recognition that FE needs to frame ESD differently, but yet *again* the guidance is not forthcoming for Scottish FE.

Moving away from institutional guidance to curriculum development, it has also been suggested that embedding ESD within the curriculum is challenging because lecturers

believe this will reduce their subject content (Jones *et al.*, 2008). However, it is becoming increasingly apparent that it is important that all disciplines engage with ESD, and not just the obvious subjects such as geography and environmental science (Jones *et al.*, 2008). There is no reason why virtually any area of the curriculum cannot have elements of ESD incorporated with some creative thinking (Roberts & Roberts, 2007). The greatest barrier to overcome here is the ‘willingness or ability of the academic staff to engage’ (Hopkinson *et al.*, 2008, p437).

Cotton *et al.* (2007) took this point further and investigated how lecturers’ beliefs and attitudes can impact upon ESD. They found that previous studies tended to adopt a cross curriculum approach which inhibits the kind of in-depth study that can be achieved by looking at specific curriculum areas in isolation. Jones *et al.* (2008) further studied lecturers’ attitudes to embedding ESD within degree programmes in the School for Earth, Ocean and Environmental Science at the University of Plymouth which covers a wide range of different programmes but is still in an area traditionally associated with ESD. They found that ‘academics generally supported ESD in principle but expressed reservations about its practical implementations (Jones *et al.*, 2008, p344). Moreover, ‘the best way to ‘overcome barriers to embedding ESD in the curriculum support a multi-dimensional approach, and one that enables interaction with the ESD agenda on many levels’ (Jones *et al.*, 2008, p349). Beyond the curriculum, successful ESD should encourage ‘a heightened sense of community and of links to the wider world, as well as improved development of agendas such as health promotion, social inclusion and community wellbeing (Scottish Government, 2010, p5). Furthermore, all of these approaches should encourage ‘holistic and interdisciplinary perspectives to be embraced, then the justification for embedding ESD into curricula becomes no longer necessary’ (Jones *et al.*, 2008, p349).

Another obstacle is the need to encourage students to challenge their own beliefs in order to bring about change, rather than simply teaching them subject matter and trusting to its effects (Katayama & Gough, 2008). This area is even more challenging because, despite widespread agreement that ESD should be the core of the programme, the scale of sustainability is wide and varied. It covers a very broad range of issues from resource depletion, climate change, pollution, environmental degradation and human social and economic issues. The challenge is then how to ensure such a wide range of issues – all of enormous complexity and interconnection – are all addressed in all areas of the curriculum (Sherren, 2008). One solution to this is to defend the view that ESD is different from

environmental education which tends to ‘focus on teaching and learning about, in and ‘for’ the environment (Tilbury & Wortman, 2004, p9). ESD on the other hand ‘seeks a transformative role for education, in which people are engaged in a new way of seeing, thinking, learning and working’ (Tilbury & Wortman, 2004, p9). Embracing this distinction involves human behaviour change which is a challenge in itself.

As we have seen, several studies have focused on barriers to embedding ESD. However, there has been little research into exploring lecturers’ views on appropriate pedagogies for ESD (Cotton *et al.*, 2007). The inhibitions of teaching staff and appropriate guidance for ESD may be achieved to some extent within FE where ESD is being driven by the Scottish Government as evidenced by *Learning for our Future* (Scottish Executive, 2006) and *Learning for Change* (Scottish Government, 2010). Also the Scottish Funding Council Strategic Plan 2012-15 states ‘there will continue to be a policy focus in Scotland on promoting environmental sustainability’ (SFC, 2012, p8). At the same time, it has also been noted that when the curriculum is viewed as the *only* potential area for implementing ESD knowledge and skills, this can itself contribute to the barriers already highlighted.

In order to help overcome some of these barriers it has been suggested a variety of methods to incorporate ESD may achieve the best results (Hopkinson *et al.* 2008). ESD should be holistic, whereby the process of learning is as important as what is learnt. This means deep learning is required and valued, not simply teaching facts and figures but creating an active, transformative process of learning within which the values can be lived out and theory put into practice (Warburton, 2003). In the same vein, enthusiasts for ESD in education are turning to other measures where the informal curriculum articulates with campus approaches (Winter & Cotton, 2012).

The methodology of this research aims to take all of these barriers into consideration to ensure that they are properly understood and remedied. To help address some of these endemic issues, Hopkinson, *et al.*, (2008) suggests a four c’s approach should be utilised incorporating:

- curriculum,
- community,
- campus, and
- culture.



Integrating all of these elements could enable, they argue, a shift from ‘education *about* sustainable development toward education *for* sustainable development therefore acknowledging the importance of developing knowledge, skills and values’ (Hopkinson, *et al.*, 2008, p438).

Currently the situation appears that ‘ESD remains poorly researched and weakly evidenced’ (Tilbury, 2011, p9). This is despite the fact that we have the knowledge from the first five years of the DESD, that we know that current economic thinking has to change, and that we know that education is a decisive factor. But we need to put our knowledge into action throughout the remainder of the DESD (UNESCO, 2009).

Another problem that may be hindering progress and impeding engagement with ESD in FE is the question of accreditation. An argument that often arises regarding informal learning for students is ‘that student engagement is difficult unless there are formal ‘rewards’ in curriculum terms’ (Ryan, 2009, p15). This is not only an issue for students, for ‘accreditation would provide educators with standards to aim for as well as indicators of success’ (Smyth, 2006, p261). The same observation can apply to employers who often harbour expectations around professional accreditation and a recognition that all aspects of students’ learning relate to the attributes they seek in prospective employees. This explains why another element of the present research is to credit rate the materials used for the intervention so that they are developed in accordance with the Scottish Credit and Qualifications Framework. This is because:

Colleges also deliver courses that, whilst certificated, do not lead to recognised qualifications. They often do so for good reasons: for example, to recognise the achievement of students who cannot reach the standard of national awards; and that of students on very short courses. However, the problem is that these non-recognised qualifications can lack currency in the labour market and have had no testing against national standards for employer/vocational needs. (Scottish Government, 2011, p33).

## **Conclusion**

Whilst it has been recognised this has been a very volatile period in ESD/learning for sustainability evolution, theory and practice, not only in Scotland but also the rest of the UK, it has also been determined that ESD remains prominent, however its potential has

still not been fully realised. In terms of policy implementation, it would appear there has been ‘an overabundance of sustainability rhetoric but an underachievement of sustainability action’ (Scotland’s Way Ahead, n.d.). Globally, the introduction of the Sustainable Development Goals and the ‘hype around using sustainable development as an anchor for the next wave of international development goals, seems to be oblivious to the fact that sustainable development is still a contested concept’ (Matenga, 2015, p281). Kagawa and Selby (2015) believe this is because ‘those making the real decisions have felt more comfortable with not shining too bright a light on meaning’ (p37) and furthermore, ‘there has likewise been an absence of acknowledgement that the term is of disputed meaning *and* value’ (p37, emphasis mine). In some ways therefore, sustainable development, sustainability and ESD, may be no further forward in terms of conceptual understanding, and cannot be disassociated from *sustainable growth*. *Economic* or *sustainable growth*, in the current global neoliberal economic model, may be the ideology for increasing levels of poverty and anthropogenic climate change (McCloskey, 2015). Or as Huckle and Wals (2015) describe it, the economic model of *sustainable growth* could be the ‘hegemonic force blocking transitions towards genuine sustainability’ (p491).

## Chapter Three – Methodology

### Chapter Purposes

- To situate the philosophical position of the researcher in relation to the research.
- To introduce the research design and justify it to meet the research objective and answer the research questions.
- To demonstrate the appropriateness of the research approach for inquiry in the discipline of education for sustainable development (ESD).
- To explain the research instruments, types of data generated and approaches for data analysis.
- To clarify the ethical considerations required as part of the research process.
- To set the scene for the following chapters that present and discuss the data generated and analysed through this methodology.

### Introduction

The overall research rationale along with the research questions to be answered and the key ideas to be explored were introduced in Chapter One. Chapter Two explained the need for education for sustainable development (ESD) in order to address the *environmental crisis* humanity is facing due to environmental issues such as anthropogenic climate change, population growth, the use of finite resources and global inequality. This chapter explains and validates the methodology utilised to aid the progression of ESD in the Scottish college sector as well as justifying the chosen methodology as the most appropriate – in my opinion – to successfully achieve the objectives of the research. The chapter begins by considering where this research fits within the current ESD context in Scotland's colleges and relates it to the exploratory approach adopted. The bespoke research design – based on a mixed methods interpretivist qualitative approach with elements of critical realism and practitioner research – and how they link to the research aim is then made clear. Ethical considerations pertaining to the research are also illustrated.

### Situating the Research in the Current ESD Landscape

The aim of this research was to address and try to overcome some of the factors that have been highlighted so far that impede the advancement of ESD in the Scottish college curriculum. In order to do this effectively the overarching research theme was to:

- Investigate to what extent, as an active practitioner, my work can impact the ways ESD is developed in colleges where I can influence it as an insider, and to begin an excursion into unfamiliar un-researched territory to provide an agenda for future researchers.

This research also served to acknowledge the importance of using education as a tool to achieve sustainable development and aimed to confirm methods that can be effectively utilised in colleges to do so. I was able to investigate this at a local level in one college through my role as the Sustainable Development Adviser (November 2010 – June 2015), but also at a national level via my work as a Project Consultant on the ESD Scottish College Project (September 2011 – June 2015) which was funded by the Scottish Funding Council. This project was originally managed by Scotland's Colleges (now Colleges Scotland) and then the Environmental Association for Universities and Colleges (EAUC). The ESD Scottish College Project provided me with validation to contact all of Scotland's colleges thereby enabling me to gain access to college staff and students. As the invitation to join the ESD Scottish College Project came after the acceptance of my research proposal, my research was guided by professional opportunity and this experience influenced the methodology. Having this opening meant I could build real relationships with staff in institutions where I was not directly employed, which afforded me access to working in their college. This work consisted of both continuous professional development, for staff to further their college sustainability policy, but more importantly in engaging with students who could provide feedback as learners on the materials I had developed. It also gave the learning and teaching materials I had developed a broader audience outwith my own college. As relationships developed, further work opportunities arose and this – along with significant changes in the Scottish college sector during the research period – meant that the research design had to be flexible, adaptable and iterative because the research had to evolve in relation to shifting conditions in the sector.

As well as the challenges caused by the changes in the sector, there were also other significant issues to address related to the themes discussed in Chapter Two. To address these issues my research began with the belief that the approach of working in *partnership* with college staff to recognise areas for collaboration where ESD could be considered was absolutely vital. Education Scotland (2012) established in their subject-based *Aspect Report for Hairdressing, Beauty and Complimentary Therapies*, for example, that 'programme teams should ensure promotion of equality and diversity and sustainability is included within programmes' (p29). However, the report also recognised that some

lecturers were not using opportunities to promote these values (Education Scotland, 2012). This omission could be the result of any of the significant issues already addressed and may confirm that teaching staff often require an experienced ESD practitioner to work with them (McNaughton, 2012). McNaughton (2012) arrived at this conclusion from evidence provided by research conducted with primary and secondary school teachers in Scotland. This research highlighted that when provided with appropriate support, (in this instance a master's level optional module, *Education for a Sustainable Environment*, offered as part of the Chartered Teacher programme at the University of Strathclyde) 'teachers in all disciplines can incorporate aspects of ESD into their classroom activities' (p778). It may also be beneficial for teachers to work with ESD practitioners because the ESD practitioner can advise them on how to overcome some of the barriers, such as lack of time and space in the curriculum, by showing them where to make the links to sustainability.

### **Consideration of Different Research Approaches**

To understand the philosophical position that underlies this research I need to explain what has influenced my theoretical thinking. In the last few years, I have emerged from a positivist view of empiricist knowledge production through observation and experimentation to a research locus that understands the positionality of the researcher as a proactive and reactive agent. This change has resulted in my earlier adherence to Popper's dis-confirmatory approach evolving into a more Weberian view of an alternative 'social thinking' about science. My early research experience began with a natural science undergraduate dissertation investigating river flooding based on the scientific principle of testing a hypothesis. However, I started to favour a social science based approach during my Master's dissertation – even though I was undertaking a Master of Science degree – because my research was conducted within education and a social science perspective not only provided the required information but also felt more epistemologically socialised. To this end, although my current research is now distinctively within the constructivist social science spectrum, I believe my earlier experience provided me with a post positivist mindset rooted in science training and which is reflected in the flexibility of my methodology. As a trained natural scientist, I affirm the importance of objective data but I now also recognise how that data is embedded in, and mediated by, elements such as values, attitudes, choices etc., that cannot always be seen *prima facie* in the data. This is perhaps seen most clearly in the obvious fact that as an educator and researcher I am not at all neutral on the subjects of sustainability and ESD. I am instead a teacher and activist with a partisan interventionist interest in furthering the goals of ESD.

My early research was testable by observation or experiment – which has influenced my current research style – however, I now need to go beyond purely *observing* what happens to understanding *why* it happened. This juxtaposition between natural and social science is the realm of ‘critical realism which was devised precisely with the relation of the natural to social sciences in mind’ (Benton & Craib, 2011, p50). Taking my earlier experiences into account, I want also to be clear that I am a part-time practitioner undertaking full-time research and not chiefly a philosophical thinker. However, because our philosophy or critical thinking will always inform our practice, I was not approaching this field entirely unbiased or impartial in outlook. I recognise that ‘to argue against the need to foreground philosophical concerns is to suggest that issues of validity, reliability and truthfulness should not be central to the work of researchers’ (Scott, 2005, p635) and I wish my findings to be subject to rigorous scrutiny.

This research project was concerned mainly with qualitative data. The nature of the project lends itself very well to qualitative research because ‘it cannot be done by rote or recipe and requires highly active engagement from its practitioners’ (Mason, 2002, p1). This project evolved over time through active participation by me as the practitioner and researcher. As a result, the methodology had to adapt to overcome changes – not only within the individual institutions where the research was conducted – but also at a national level with Scottish college educational reform. A developing methodology indicates as Walford (1998) suggests that a ‘flexibility of method is far removed from the traditional presentation of social and educational research as being unproblematic and merely a process of questionnaire design, interviews and observations with predetermined methods and inevitable conclusions’ (p4). Such a static social science paradigm would have been entirely inappropriate for this work in view of the highly fluid institutional and political context within which it was conducted.

I therefore come back to critical realism, because natural science attempts to ‘eliminate any references to beliefs, purpose and meaning whereas critical realism prioritises social actors’ descriptions of their experiences, projects and desires’ (Scott, 2005, p644).

Furthermore:

Critical realism acknowledges that social phenomena are intrinsically meaningful, and hence that meaning is not only externally descriptive of them but constitutive of them (though of course there are usually material constituents too). Meaning has

to be understood, it cannot be measured or counted, and hence there is always an interpretive or hermeneutic element in social science (Sayer, 2000, p17).

Hence critical realism, as a ‘scientific’ but non-positivist approach to the social sciences, underpins the bespoke mixed methods design of this methodology. Critical realist thinking – as defined by Bhaskar – advises that empirical observation is not enough. Bhaskar advises of three domains of reality – empirical, actual and real (1979). In order to understand causality, empirical regularities need to be considered in relation to the mechanisms that influence them. For instance, with ESD it is not simply enough to ask if a college has embedded environmental awareness in course provision, which it has the power easily to do. Instead it is necessary to ask if the relevant policy framework is in place to achieve such awareness. For example, is there support to develop programmes? Is there funding available to do so? And is there institutional commitment? This complexity explains why Bhaskar’s (1979) critical realism is frequently employed for educational research. It also offers hospitality to positions of advocacy such as mine, where the task is to monitor ongoing change whilst critically analysing it.

Critical realism is thus aware of the real world around us, but also acknowledges it exists independently of our knowledge of it. Believing an independent reality exists does not mean that we absolutely know how correctly that reality functions (Bhaskar, 1979). ‘Traditionally ‘realistic’ research had negative connotations commonly meaning there are not very high expectations of something’ (Benton & Craib, 2011, p120). By contrast, critical realism aims to alter unsatisfactory realities. Our knowledge of the world, it suggests, is fallible because an interpretivist epistemology means that how we view the world is indelibly coloured by our own perception—and individual perceptions vary. To avoid this sliding into radical subjectivism, critical realists ‘introduce notions of objectivity and truth via the idea of internal critique’ (Scott, 2005, p645). However, the viewpoint of many critical realists including Scott (2005), is the rejection of quantitative modelling, whereas from the standpoint of *scientific* realism this rejection is deemed unsound (Nash, 2005, p186). It can be argued that critical realism and scientific realism are closely related positions (Nash, 2005, p186) and regular events in the social world can provide an ontological basis for quantification and non-positivist interpretation (Kemp & Holmwood, 2003). It can therefore be argued that in research practice, critical realism and scientific realism are perfectly compatible positions because regular, examinable events in the social world can provide an ontological framework for investigation. I return then to the question of my own partiality, admitting that neither I nor my research subjects are impartial on the

matter of ESD because ontologically it forbids a neutral stance. This can be unsettling for many researchers, but if it is seen as a condition of research rather than a limitation of research then it can be empowering.

Whilst I acknowledge my research may have a critical realist philosophy underpinning it, I am also aware that it is being recognised increasingly in positivist circles that scientific evidence is not an objective datum. Social and educational research has traditionally tried to justify research procedures by making them increasingly ‘scientific’ and ‘objective’, but contemporary theory recognises that this can be a dead end for educational research and should not be so (Walford, 1998, p2). There are indeed arguments to suggest that much previous educational research was conducted as a pseudo-scientific process but in reality was rarely scientifically objective because of the inescapable subjectivism of the enquiry. As well as believing that my research can be both partial and objective, I also hope *subjectively* to influence practice, agreeing that ‘on the whole, it is probably the case that most of the research that readers of the *British Educational Research Journal* engage in and read about is research that investigates, rather than drives, policy’ (Sikes *et al.*, 2006, p157). Whilst ‘education researchers are not necessarily under an obligation to make their research explicitly useful, any more than researchers in many branches of the social and natural sciences’ (Sikes *et al.*, 2006, p172), my contention about the partisan nature of ESD makes my desire for impact another object of interest and enquiry. I therefore support Clark’s (2011) position that ‘educational researchers at the very least are logically required to recommend the implementation of what they have concluded’ (p52). Indeed, I hope to go further than merely recommending improvements for embedding ESD, by also intending to see the recommendations put into policy and practice. If this makes me a social actor in my own research environment, I fully affirm this as a basis for authentic practitioner enquiry.

Since embedding ESD in the curriculum, particularly in tertiary education, is still in its infancy, (Lipscombe, 2008), there is a significant deficit of large-scale research available. Similarly, the optimum means of conducting this is still open to debate. One argument is that an exploratory approach is appropriate when investigating an area that has been little researched to date. However, ‘very little is known yet about the way to implement effectively a comprehensive, integrated approach’ in virgin academic territory of this kind (Deschenes *et al.*, 2003, p389). Educational research by its very nature is always going to be difficult, owing to the shifting nature of individual behaviour, relationships between individuals and changing external conditions that do not remain constant over time and



settings (Walford, 1998). To overcome these problems of complex phenomena, a mixed methods or broad exploratory approach is increasingly favoured in such settings.

One method that may be suitable for inclusion in a mixed methods paradigm is action research. Action research aims not only to generate new knowledge but also looks to solve any problems discovered and effect change (Fox, *et al.*, 2007). Action research can also be utilised as a tool for personal development in order to make the researcher more skilful in their work (Noffke, 2009). Practitioner research is a form of such “research in action”. Traditionally, practitioner research involves a practitioner engaging in part-time research usually in their working environment. This project differs from traditional practitioner research because I conducted it as a full-time researcher engaged in part-time practice (through part-time employment), rather than as a full-time practitioner engaged in part-time research. However, the chosen methodology went further than identifying problems that stand in the way of change because it was far more interpretive by its very nature because: ‘qualitative research practitioners need to use their own examples and think for themselves in the research process because most of the key decisions about research are made by the researchers’ Mason (2002, p2). This was part of my justification for using my own materials – not as a recipe for staff to follow – but as a starting point for ESD consideration in their individual practice.

The interpretivist, qualitative approaches foregrounded in this research support the kind of positionality that allows for forms of reflective practice, which enable continuing self-assessment and improvement. This is the perspective of the professional stranger – who belongs but does not belong at the same time. I was in this position because I did belong within the setting, but at the same time I had acquired tools to distance me and was in an exogenous position which allowed for interpretivist reflective practice to enable continuing self-assessment and improvement. Furthermore, ‘teachers by reflecting on various aspects of their professional situation are similarly said to be liberated to achieve more effective practice’ (Clark, 2011, p44). Although I was not a teacher in the conventional sense assumed by this perspective, I was still expressly influencing learning and teaching through my teaching materials, and by the interaction I had with staff and students, and the research process helped my practice evolve. Moreover, although I had questions I wanted to investigate from the outset, I also wanted to see what issues the research would uncover over a period of time by virtue of my professional positionality and then adapt my approaches accordingly to examine them. It should be clear by now from my argument that critical reflection was imperative to this style of practitioner research, since this project

was not descriptive but interventionist, and it sought to evaluate the impact of an educational initiative for which I was the responsible officer. This was of course an iterative process in which I was continually oscillating between the incremental interventions I was pursuing, the attitudes I was seeking to change, and my critical assessment of all of these volatile elements.

Although I was immersed within the field I was researching, I still had to overcome the issue of gaining access to the research setting, not only in terms of the physical research setting, i.e., the college itself, but more importantly with respect to the need to build relationships and establish trust with the research subjects. This was only made possible through continued work in these colleges on the staff development sessions I delivered, which gained trust and made staff open to me working with them and their students. However, once this staff engagement was secure I still needed to have meetings with students to explain what ESD is and how it relates to their area of study. Only then could I suggest they might want to take part in the research process. The first eighteen months of the project consisted of this crucial relationship-building before the research process began.

The relationship building period was essential because this is where my own consciousness of the dynamics of the research players involved, myself included, developed to the stage where I was aware that ‘everyday reality consists of the meanings and interpretations given by the social actors to their actions, other people’s actions, social situations, and natural and humanly created objects’ (Blaikie, 2000, p115). In relation to the interpretivist stance to which I was becoming increasingly attuned and aligned, I came to realise that ‘in short, in order to negotiate their way around their world and make sense of it, social actors have to interpret their activities together, and it is these meanings, embedded in language, that constitute their social reality’ (Blaikie, 2000, p115). Furthermore, ‘an interpretive approach therefore not only sees people as a primary data source, but seeks their perceptions also’ (Mason, 2002, p56). This means that although I was reading the data generated in an interpretive manner, concerned with what the research subjects meant, I also had to interpret all that can be inferred from beyond the data in the light of my own professional locus.

## **Justification for the Chosen Research Methodology**

Having introduced various methodological approaches and discussed their effectiveness in ESD research, I will now argue their appropriateness for this research project. The arguments introduced in this regard are:

1. the critical realism perspective underpinning, but not completely enveloping, the research methodology;
2. the broad exploratory approach utilising a mixed methods design to explore an under researched area;
3. an interpretivist qualitative research project, allowing for self-reflection, which was as critical to the project as any other research procedure.

Critical realism classically aims to self-correct and improve our current understanding of knowledge in light of new knowledge which research will establish. Critical realism understands that current knowledge is always ‘open to correction in the light of further cognitive work and is therefore ‘fallibilist’ in contrast to relativist theories of knowledge’ (Benton & Craib, 2011, p122). That is why it is a suitable bedrock for this research project, since the materials I had developed needed to be re-evaluated in light of feedback received after they had been used. This process started early because it was essential that the work progressed in an organic manner and evolved as it was implemented.

As suggested above, it is being recognised increasingly that ‘education should play an important role in enabling people to live together in ways that contribute to sustainable development’ (UNECE, 2012, p6). This is in large part attributable to the growth in current knowledge, which critical realism would recognise can be re-orientated through research in order to establish conventional uses of education: ‘education at present often contributes to unsustainable living as there is a lack of opportunity for learners to question their own lifestyles and the systems and structures that support those lifestyles’ (UNECE, 2012, p6). This project confronted some of the key inadequacies and complicity of conventional education and aimed to provide learners with the knowledge to question current unsustainable practices both in their lifestyles and their employment.

The research was however not excessively prescriptive because the research design and proposal were of my own making, not prescribed to me by another party, and intended always to support my own permanently unfinished professional development. The

relationship I had with my Supervisor, Dr Bethan Wood, also influenced the research questions and design prior to starting the research. I was fortunate in that oftentimes researchers will have to conduct research projects that they themselves did not design. However, because this research project *was* of my own design and evolved from *my* background working in FE, I was able to shape it to my own experiences. After the research proposal was accepted, the research design continued to develop in tandem with my experiences developing with Scotland's Colleges (now Colleges Scotland) and the EAUC led Scottish College ESD Project, along with the interactions with college staff and students throughout the period. This is of course consistent with a *constructivist paradigm* that believes 'the researcher should have a voice and state their position about why and how the research is done' (Reunamo & Pipere, 2012, p314). Aspects of constructivism continued into the joint creation of meaning, learning and artefacts by me and the students because I, as the researcher, as well as the ESD practitioner, required an insight into how meaning by myself and the research subjects is being constructed.

As my career unfolded at the start of the research period, further opportunities arose, such as the invitation to work on the Scottish College ESD Project, and at points such as these crucial decisions had to be made about altering the scope of the research. This opportunity enabled me to work with colleges other than just the one at which I was employed and therefore broadened the scope of the case study element of the research. Since these opportunities were too good to be missed, they have meant the methodology has been organic and has grown and evolved with me as a professional person. This has sometimes caused particular problems in deciding where to draw the line and decide the definitive scope without looking for further opportunities that could be utilised. However, a positive impact of these changes have been that I have been able to immerse myself within the research because 'besides the traditional survey approach, it is also important to hear the voices of individual researchers, allowing them to reconstruct the research paradigms where they locate their ESD research (Reunamo & Pipere, 2012, p314).

Approaches to the embedding of ESD across the FE curriculum in Scotland have never been systematically evaluated or researched in any significant detail. This research therefore needed to be exploratory across the board – from policy at a national level, to support from senior management at college level in relation to policy, (both that of government and their own college policy, where it exists), to practice in the classroom and knowledge of staff and students. The research of course aimed to go beyond simply *explaining* what happened in order to understand also why it happened. This helped me

*understand* why and how ESD evolved in this manner. It should also be clear that I desired to self-evaluate the practical response to my approaches and materials.

A study by Reunamo and Pipere (2012) confirmed that ‘the relationships between research, the researchers’ orientation, studied phenomena and environmental changes are especially acute in ESD’ (p323). I was keenly aware of these interactions and unreservedly trusted that this research would strengthen my own professional self-awareness. From this analysis the connection between self-evaluation and interpretivism in relation to ESD was evident because interpretivism is ‘concerned with understanding the social world people have produced and which they reproduce through their continuing activities’ (Mason, 2002, p56). Furthermore, ‘qualitative research is grounded in a philosophical position which is broadly interpretivist in the sense that it is concerned with how the social world is interpreted, understood, experienced, produced or constituted’ (Mason, 2002, p3). Whilst this may appear a somewhat ethnographic description, it needs to be remembered that although interpretive approaches are similar to ethnography in that people and their perceptions are the central primary data sources, interpretivism does not rely upon total immersion within a social setting, as ethnography demands. This means interpretivism was far more suitable for this research because it supports studies that use interview and questionnaire methods to explore individual and collective understandings. Hence within this paradigm the researcher can belong to the research environment but still have sufficient distance to analyse it.

The customised design of the methodology adopted was based on mixed methods utilising both qualitative and quantitative data, because as suggested this fits with the critical realism underpinning since ‘any reconciliation between qualitative and quantitative methods and methodologies has to take account of the principles enshrined in a critical realist meta-theory’ (Scott, 2005, p634). One such principle is the recognition of *authenticity*. Since the bulk of this research was qualitative in nature there were a variety of instruments utilised that ranged from a college wide survey to intensive case studies, employing questionnaires, focus groups and informal interviews. The survey was issued through Survey Monkey to all college Principals to establish attitudes to ESD and the use of the teaching materials that I had developed and which were provided to all Scottish colleges. The diversity of these tools does not ensure authenticity but it does generate multiple forms of data which can then be tested against each other as potential explanations and extrapolations emerge. A full explanation of the teaching materials I developed – which were in the form of workbooks – will be provided later.

Developing a mixed methods broad exploratory approach can be very useful for practitioner researchers because different types of research can complement each other (Creswell, 2003). It has also been argued frequently in educational research that ‘to solve problems in education ... the distinction between practitioner and researcher needs to be removed and the link between being a practitioner and researcher strengthened in an approach known as ‘*participatory* action research’ (Fox, 2007, p52, emphasis mine). Whilst this research was not directly analogous with action research, the *participatory* element nonetheless remained because it was unlikely I could maintain researcher distance and have no influence upon the research setting. My observations were imprinted by my experiences for the ‘notion of researcher distance or neutrality is not only impossible, but completely defeats the epistemological purpose of immersing yourself in a setting. In other words, you are – according to this view – supposed to know what it feels like rather than simply act as a detached witness’ (Mason, 2002, p92).

The barriers to embedding ESD within the curriculum in Scotland’s colleges that this research hoped to begin to provide answers on how to overcome were as follows:

- The lack of perceived importance and relevance of ESD in the curriculum, both by staff and students.
- The lack of time and space in the curriculum to incorporate ESD.
- Lecturer’s lack of knowledge and confidence to engage with ESD.

This was achieved by evaluating the effectiveness of the ESD curriculum specific workbooks that I had designed. The workbooks were split into chapters, some of which were generic. However, the curriculum specific workbooks, wherever possible were linked to specific curriculum areas because ‘ESD is most effective and credible when it is translated in context’ (Ryan, 2009, p13). I also wanted to establish how to implement systematic change to realign practice. Therefore, the methodology needed to be robust enough to override the impact of an individual with passion within the organisation leaving.

## **Research and Learning**

To summarise – in order to overcome some of the barriers highlighted so far there were a number of methods that were employed. Sterling (2012) pointed out that ‘ESD is not:

- a separate subject or discipline;
- separate from and unrelated to other HE agendas such as employability, enterprise, quality and internationalisation;
- just about “the environment”; or
- a passing fad’ (p7).

I attempted to embrace these points, wherever possible, when developing my own ESD learning and teaching materials. While it is true that teaching staff may be unsure where to address ESD through the curriculum, there ought to be no area of the curriculum where ESD cannot be made relevant and embedded within the subject. The task just may require more creative thought in some areas than others (Roberts & Roberts, 2007). ESD should not be a separate subject and I believe students will engage with ESD more effectively if it is delivered within the context of their chosen area of study.

The case study element of the research complemented the survey element and established if working intensively with individual institutions strengthened their ESD curriculum development to a greater extent than the generic ESD landscape across Scotland. Case study research has been identified as a suitable method to utilise in investigating sustainable development in higher education. However, one criticism has been that many cases published to date have been superficial because they have had limited links to theory and minimal details of the methodology and the data collected (Walker *et al.*, 2004). Therefore, I needed to ensure my methodology was robust enough to avoid this. This was also part of the reason why I focused on the difference between policy and practice. I was also aware that my methodology would only measure reasonably how knowledge and skills are changed by my materials at that point and it would not measure any long-term behaviour change.

Research is required to link the theory of embedding ESD in the curriculum with the practicalities of actually doing it. This is why I combined research with the opportunity of actually working in FE institutions to do the work. There is evidence that not much research of this nature has been conducted. The research ‘remains the individual academic’s prerogative and occurs independently and separate from institutional sustainability programs’ (Beringer and Adomßent, 2008, p609). I was therefore in a unique position to exploit this gap by combining research with an assessment of institutional sustainability programmes and commitment. Sustainable university research is where the institution is ‘both the object of study as well as the locus for the envisioned

transformation (in this case embedding ESD in the curriculum) which the research seeks to facilitate' (Beringer and Adomßent, 2008, p610). Hence I was hoping once again to ensure authenticity in a critical realist style.

### **Data Collection and Analysis**

The volume of education has increased and continues to increase, yet so do pollution, exhaustion of resources, and the dangers of ecological catastrophe. If still more education is to save us, it would have to be education of a different kind: an education that takes us into the depth of things (Schumacher, written 1974, published 1997).

The aim of my research was not to just add to the volume of education by producing more teaching materials, but rather to pursue education of a different kind by attempting to embed ESD within the student's course of study, instead of having it bolted on the side. I wanted my materials to be used as an integral part of the course that has to be covered in the same way that core skills and equality and diversity are now embedded within FE as part of every programme of study. This is not simply adding to the volume of materials, but rather ensuring these materials were embedded and not contextualised.

The first part of the research was a Survey Monkey questionnaire (Appendix II) to all college Principals in Scotland, which included a broad exploratory investigation of senior management strategic perspective on ESD in FE in Scotland. This was coupled with a bespoke investigation of the barriers to embedding ESD in the curriculum and a suggested methodology for overcoming these through the evidence of the case studies at 3 colleges.

The three colleges chosen as case studies were evaluated against the bigger picture of ESD in general in FE in Scotland taking into account the following:

- The collected data was compared to current government policy and practice wherever possible.
- The findings were linked to college strategies, i.e., their Sustainability Policy, Carbon Management Plan, Fair Trade Policy etc., to see if practice within the college matches their policies.

In Year One I focused on gaining access to colleges by them inviting me to present to staff and/or students as a result of events I presented at for Scotland's Colleges and the



Environmental Association for Universities and Colleges. I started to build relationships with some colleges and lecturing staff as a result of this. Therefore, in terms of action research, the initial intervention was the presentation at the college where the teaching materials were introduced. I designed the teaching materials and the research undertaken at the 3 case study colleges was based on these materials. The materials were in the form of workbooks and are available in the Appendices (Appendix IV and Appendix V). The case studies were as follows:

- Case study 1 with Beauty students using the *Hairdressing Heroes Workbook* (Appendix V) at college A.
- Case study 2 with Hairdressing students using the *Hairdressing Heroes Workbook* (Appendix V) at college B.
- Case study 3 with Care Students using the *Introduction to Sustainability Workbook* (Appendix IV) at college C. A broad view across different curriculum areas of student's sustainability opinions were also obtained at college C and analysed.

The data was collected by:

- Questionnaires completed by staff and students before and after using the workbooks.
- Semi structured interpretivist observations and meetings with students.
- Semi-structured interviews and observations with key staff across the 3 college participants.

For case study research, semi-structured interviews are the most common forms of enquiry because they provide information in between that of a structured questionnaire and of listening to a natural conversation. This allows flexibility in obtaining participant opinions whilst still conserving an element of structure related to the research questions and themes.

It was also made clear to the colleges with which I worked that my findings would be used as case studies. Permission was sought and obtained from all colleges involved. These colleges will remain anonymous; however, the identity of the colleges will probably be clear by inference to staff within the EAUC, Colleges Scotland, the Scottish Funding Council and Education Scotland, who are all aware of the colleges with which I worked. This was an ethical consideration which has formed part of the ethical approval procedure.

The data generated was split into two separate categories, macro and micro. The macro level provided a generic picture of ESD in Scottish college education taking into account government guidance and how this translates into policy and practice across Scotland. The Survey Monkey questionnaire to all colleges generated this information. This helped to identify the potential for institutional change to embrace ESD in new ways or even to start to embrace ESD. At a micro level individual college policy was evaluated and this along with what I discovered from the case studies provided the required data for analysis.

I was also trying to evaluate if staff and students acquired knowledge and skills about sustainability through the measures I was examining. I was not looking at long-term behaviour change, which would be an area for further research on the foundation of this present study. What I did hope to establish was an increased awareness of environmental or sustainability related issues in relation to the area of the curriculum being investigated and also the personal investments of the research subjects.

The materials I developed were used in the case studies on which staff and students will provide feedback. Staff and students were also asked to complete questionnaires before and after engaging with the workbook materials to determine if their views had changed. The workbooks also formed the basis of some of the questions on the survey to college Principals. The workbooks could be used either by staff to give them the knowledge and skills to embed ESD into their teaching, or they could be used directly by students to work through. Ideally they would have been used by both staff and students. They were designed to be easily adapted into online resources. They were split into identifiable chapters, with assessments for completion built in at the end of most chapters. At the college where I was employed they had already been developed into electronic online learning resources as Moodle courses. Each subject specific workbook pack came with two workbooks, one for students where the assessments were left blank for students to complete, and one for staff where the answers to assessments were provided, or where there are no right or wrong answers, guidance was provided.

The first workbook was originally designed as a generic staff development workbook at the college where I was employed as the Sustainable Development Adviser. This *Introduction to Sustainability Workbook* (Appendix IV) was purchased by Scotland's Colleges and distributed to all colleges in Scotland. The Survey Monkey questionnaire (Appendix II) which was issued to the Principal of every college in Scotland was concerned mainly with how colleges had engaged with this particular workbook.

However, if a college had engaged with any of the other workbooks available in the range, then the questions were also relevant to them. The questions aimed to determine if they had used the *Introduction to Sustainability Workbook* and if so how they had used it and their opinion of its relevance. The other workbooks which were available then for staff and students and which were all curriculum based and were as follows:

- *Hairdressing Heroes: Fighting the Carbon Battle*,
- *The Construction Challenge: Fighting the Carbon Battle*, and
- *Beauty Shouldn't Cost the Earth*.

All of these workbooks had either been purchased by other colleges in Scotland from my employing college, or were produced after Colleges Scotland purchased the rights (*Beauty Shouldn't Cost the Earth*) and were in use at other colleges.

Scientific reporting implies that there has been a distinct sequence of events with clearly defined stages of data collection followed by analysis and reporting. In reality this sequence is often jumbled and the process is rarely sequential and organised, with data collection continuing throughout the research period and analysis continuing later than initially intended. This has very much been the case with my research, with the research process being particularly hampered by the Scottish college sector changes.

Collected data was evaluated using the following software:

- NVivo software (Version 10) was selected for classification, coding and storing of the data and themes (nodes) were established to code data to.
- Survey Monkey for the questionnaire to all college Principals (Appendix II).

### **Ethical Considerations**

The human assault on the terrestrial environment shows no signs of abating and some signs of spilling over into non-terrestrial environments. ... Many are appalled by this destruction ... because of what it implies for themselves, their children, their friends, other creatures in the biomass [global nature], and the planet we inhabit. This response is in many instances an ethical response. People judge that what is occurring is not merely irritating, inconvenient, disappointing, or unfortunate, but immoral, bad, wrong or evil (Elliot, 2001, p177).

This research hoped to highlight some of the issues concerned with '*the human assault*' in order that staff and students who engaged with the materials could think of alternative work and life practices that may be less environmentally damaging. The research had the potential to have a positive impact upon ESD development in Scotland and therefore was of importance in advancing government policy concerning ESD and wider societal impact. Considering the level of potential positive impact, there was correspondingly little risk of possible harm to the participants. At a global level, ESD can be used as a tool to help achieve some of the aims of the United Nations Decade of Education for Sustainable Development (UNDESD) and to help raise awareness of the United Nations Millennium Development Goals (MDG). Some of the problems being tackled by the UNDESD and the MDG, which ESD looks to overcome, are life threatening to many people around the world. Overall, the ultimate aspiration is that there were far more positive benefits than possible harms as a result of the research. It ought to be stressed that in my view the most serious harm looming in the shadows of this research would be the consequences of failed or ineffective ESD policies and practices.

Prior to the research process starting it was mandatory for ethical approval to be sought and gained. The ethical approval process was as specified by the Ethics Committee of the College of Social Sciences at the University of Glasgow. Full ethical approval paperwork is provided in Appendix I. The research was not deemed to be high risk because there were no questions involving sensitive topics, however, there was the potential for research participants to be under the age of 18. In the end this did not prove to be an issue, with only one participant under the age of 18 (this student initially refused to take part in the research, but subsequently changed her mind and provided consent after she had turned 18). Although the research was not deemed high risk, it should still of course be recognised that all research relating to human subjects always carries the potential for harm, even unintended harm. This was mitigated by, for example, the informed consent of participants, data protection measures and an assurance of anonymity. It was also made clear to participants that there were often no right or wrong answers and that all opinions would be treated with respect. At an institutional level, I was clear I was evaluating my approaches and materials to embedding ESD in the curriculum and not looking to criticise for its own sake any institutions' lack of progress in relation to ESD. Informed consent was obtained by providing participants with information about the project beforehand and setting out the purpose and intended uses of the research. It was also made clear to students that where they had to engage with my workbooks as part of their coursework, they were still under no obligation to agree to take part in the research process. It was also

made clear that all data would be stored securely on password-protected software and hard copies of materials would be stored in locked drawers within a secure office. Full details of the information provided to participants before participating in the project is provided in Appendix I.

The research theme may be low risk but this does not mean that the research methodology may still not necessarily raise ethical concerns if not conducted appropriately. In this case although I am working as a part-time practitioner engaged in full time research, I was not a member of teaching staff and therefore I did not have direct influence over the students or their learning. I was very much in an advisory role for staff and students and I was not in a position to force them to engage with the materials I presented to them. In the college where I was employed, the decision for timetabling students for specific ESD learning and teaching belonged with the Assistant Principal in charge of the curriculum, to whom I reported to and to whom I could make recommendations. But ultimately the final decision was not mine. I had no authority whatsoever over the research participants in colleges where I was not employed. Even so, I still needed to be very aware of the particular ethical issues that any research within an educational setting could raise. One such issue that I have already addressed is my observer partiality.

## Chapter Four: Survey into College Management Attitudes to ESD within their College

### Chapter Purposes

- To advise the survey process.
- To present the survey findings.
- To discuss the survey findings of college senior management attitudes to education for sustainable development (ESD) within their colleges.
- To evaluate the survey findings in relation to executive sustainability policy documents within colleges.
- To help set the scene for the following results and discussion chapters.

### Introduction

This chapter builds on the subject of investigation, which was introduced in Chapters One and Two and for which the broad methodological approach was explained in Chapter Three. This chapter will focus on the empirical data collected at senior management level from colleges across Scotland to determine high-level attitudes to education for sustainability within their own institutions. From this stage forwards, when referring to sustainability education in relation to my own thoughts, *education for sustainable development* will be replaced with *learning for sustainability*, the reasons for which are twofold. First, *learning for sustainability* has been formally adopted in Scotland in the course of this research as the terminology to describe sustainability learning and teaching. Secondly, during the research period my own assessment of sustainability education has grown and evolved, and I now feel confident enough to drop the *development* term because this has never felt truly comfortable within my own sustainability ethos.

### The Survey Process

The methodological approach, and relevance of the chosen methodology in relation to the survey, was described in the previous chapter. I will now explain the survey process, from determining the survey questions to the chosen method of implementation, before presenting the survey results.

## **Preparation of Survey**

The survey questions and methodology evolved as the subject of in-depth discussions with both of my supervisors. This process began early in the research period – within the first few months – and evolved naturally as the student-supervisor relationships developed. The survey methodology was also influenced by job opportunities that became available to me throughout the research period in relation to actively working within the Scottish college sector. These opportunities had not existed when the research proposal was written but as a result the research process has grown organically as my career as a sustainability practitioner has progressed.

It was evident from the beginning that I needed to have a strong focus on the survey questions to be clear what lay at the core of what I wanted to discover. I also wanted to avoid having only commentary on the survey results, but ensure I analysed the data to link it to policy and practice wherever possible. This would enable me to establish conflict or tensions if they existed. Discussions also took place with both of my Supervisors, concerning linking the survey results to college strategies such as sustainability policies, carbon management plans and Fair Trade policies, where the college in question had such policies. Therefore, in order to verify this information, I would need to formulate the survey questions appropriately.

## **Format of Survey**

It swiftly emerged that the survey should concentrate on two specific areas. The first area concerned senior management judgements of the importance of sustainability learning and teaching and how as managers they were guided on its delivery within their colleges, and also if they could demonstrate that learning for sustainability was prioritised within their colleges. The second part of the survey was to establish if the sustainability learning and teaching materials I had developed were in use within these colleges and if so were they regarded as a useful tool, or not, for embedding sustainability within the curriculum.

Closed and multiple choice questions were predominantly used in the first part of the survey to establish the policy documents and organisations referred to for ESD guidance and how college management rated their effectiveness. The questions were also intended to gauge what priority is given to ESD, how well embedded it already is and what the college has actively done, and plans to do in the future, to drive ESD within the institution. Open questions were predominantly used in the second half of the survey to determine

opinions of the sustainability learning and teaching materials I had developed. These were also intended to establish if the materials had been used, or if they were intended for use; if they have been used, the questions sought to assess management views of their strengths and weaknesses. The survey questionnaire was formatted into Survey Monkey and issued to all college Principals by the Project Administrator of the Scottish College ESD Project, who is employed by the Environmental Association for Universities and Colleges (EAUC).

### **Circulation of Survey**

The survey was circulated to nearly all college campuses in Scotland. It is important to note that at the time of distribution the Scottish college sector was undergoing a major controversial restructuring whereby many colleges were either in the process of merging or had already merged. A list of the colleges to which the survey was issued to is provided in Table 4.1. College Principal information, including email addresses, was supplied by the Scottish Funding Council. This included many acting Principals at the time, because final decisions were still to be made as to who would ultimately be Principal at many of the merged colleges. The survey was circulated during the latter stages of the merger period taking place in the sector between 2010 and 2015 and which resulted in the number of incorporated colleges in Scotland decreasing from 37 in 2011-12 to only 20 in 2014-15 (Audit Scotland, 2015, p5).

The survey was distributed through Survey Monkey by the Environmental Association for Universities and Colleges (EAUC) as part of the Scottish College ESD Project. Supporting information provided to each college also advised it would form part of this research project. Newbattle Abbey College and Scotland's Rural College were not included in the survey because they sit outside of regional arrangements with the Scottish Funding Council (SFC).



**Table 4.1 - Colleges Taking Part in the Survey**

<b>COLLEGE</b>	<b>COLLEGE</b>
Ayrshire College	Moray College University of the Highlands and Islands (UHI)
Borders College	New College Lanarkshire
City of Glasgow College	North East Scotland College
Coatbridge College	North Highland College UHI
Dumfries and Galloway College	Orkney College UHI
Dundee and Angus College	Perth College UHI
Edinburgh College	Sabhal Mòr Ostaig UHI
Fife College	Shetland College UHI
Forth Valley	South Lanarkshire College
Glasgow Clyde College	University of the Highland and Islands UHI
Glasgow Kelvin College	West College Scotland
Inverness College UHI	West Highland College UHI
Lews Castle College UHI	West Lothian College

As already referenced, during the research period there were fundamental changes to the Scottish college landscape. This point must be stressed because it has a substantial bearing on the research aims and has significantly impacted what could be achieved in terms of my ability to embed learning for sustainability. College numbers have reduced from 43 institutions in August 2010 to 27 currently operating on a regional structure of 10 single-college regions and 3 multi-college regions. The colleges and regions post regionalisation, and the current situation in Scottish FE is shown in Table 4.2.

**Table 4.2 - College Regions and Colleges Post Regionalisation**

Region	College(s)
Aberdeen and Aberdeenshire	1. North East Scotland College
Ayrshire	2. Ayrshire College
Borders	3. Borders College
Dumfries and Galloway	4. Dumfries & Galloway College
Edinburgh and Lothians	5. Edinburgh College
Fife	6. Fife College
Forth Valley	7. Forth Valley College
Glasgow	8. City of Glasgow College
	9. Glasgow Clyde College
	10. Glasgow Kelvin College
Highlands and Islands	11. Argyll College UHI
	12. Inverness College UHI
	13. Lews Castle College UHI
	14. Moray College UHI
	15. North Highland College UHI
	16. Orkney College UHI
	17. Perth College UHI
	18. Sabhal Mòr Ostaig UHI
	19. Shetland College UHI
	20. West Highland College UHI
Lanarkshire	21. New College Lanarkshire
	22. South Lanarkshire College
Tayside	23. Dundee & Angus College
West	24. West College Scotland
West Lothian	25. West Lothian College
n/a	26. Newbattle Abbey College
n/a	27. Scotland's Rural College (SRUC)

**Source: Colleges Scotland Keyfacts (2014)**

The extent of the challenges faced by Scotland's colleges during this period is further emphasised and explained by Audit Scotland:

Scotland's colleges have faced significant changes over the last few years that have had implications for funding, the provision of learning and how colleges are run, managed and scrutinised. In addition to the reduction in budgets that most public bodies have had to deal with, colleges have had to manage reforms and other changes. Many of the effects of these changes are still taking place, including standardising terms and conditions of service for staff and integrating ICT systems (Audit Scotland, 2015, p5).

Furthermore, across the sector there has been a '9.3% reduction in staff numbers between 2011-12 and 2013-14' (Audit Scotland, 2015, p4).

### **Survey Response**

The survey was issued to 26 college campuses. In total eight completed surveys were returned which represents 31% of college campuses. This was a disappointing response and therefore the survey information cannot be deemed representative of the Scottish college sector; however, the lack of response in itself provides an interesting insight into the difficulty of implementing change at a turbulent time and also may reflect how important – or otherwise – ESD is considered to be. Although 31% of college campuses are represented in the survey findings, this relates to 6 regions of the new 13 regional areas, therefore nearly half of the college regions are represented in the survey findings. The survey responses were analysed using the Survey Monkey tool and also manually.

Before analysing the responses received, I feel it is important to address the difficulty in obtaining completed replies. The difficulty in obtaining completed survey questionnaires was attributable in part to the changes within the sector which have already been highlighted, but this was further exacerbated by funding cuts, as a result of which 'Scottish government funding to colleges fell by 12.3 per cent in real terms between 2011-12 and 2013-14' (Audit Scotland, 2015, p6). Audit Scotland also noted that 'the sector reported a deficit of £95.2 million in 2013-14, however colleges' finances were generally sound and adjusting the deficit to arm's-length foundations result in an overall surplus of £3.8 million (just under one per cent of total income) in 2013-14' (2015, p6). When faced with sector changes, redundancies, funding cuts and deficits – even arm's-length adjusted ones that result in a surplus – returning a survey on any subject is unlikely to take priority.

The survey was first issued to college Principals (formally appointed and acting during the merger period) by email from the Environmental Association for Universities and Colleges on 12 December 2013 with a request for it to be completed and returned by 20 January 2014. The email contained a link to the survey as well as links to the ESD workbook materials and an explanation of the SFC funded ESD in the Scottish College Sector Project. This generated only two replies. A reminder was issued on 20 January and this generated only another one reply. It was decided at this point not to send any further reminders due to the turmoil in the sector.

A second attempt was then made at the start of the following academic year (2014-15), once the sector mergers had settled to a certain extent. I issued the email directly this time, again to college Principals, with an explanation of the overall ESD in the Scottish College Sector Project and links to the survey and the ESD workbook materials also. This email was issued on 28 July 2014 and generated another two responses. A reminder issued a month later generated one response.

On the third attempt, I appealed to individual college Principals directly in colleges I had visited and provided staff ESD training for, this generated another two responses. Interestingly, one of the colleges I had worked the most with over the previous twelve months – where I had delivered eight staff ESD training sessions which over 120 staff attended – did not complete the survey. There was now a different Principal at this college, and although he replied to me confirming he would pass the survey to an appropriate member of staff to complete, a further response was never received. The senior staff member I had previously dealt with at this college, who had requested I work with their staff, had taken voluntary redundancy not long after the college had merged.

The issue of staff leaving colleges was addressed as part of a six-month post-merger evaluation by the Scottish Funding Council where they gathered feedback from staff on the following:

The general impact of the merger, the culture of the organisation and the progress made with finalising staffing structures. While there was some evidence of staff highlighting the positive results of the mergers, a number of areas of concern were raised, including increased workloads and the loss of staff with key skills and knowledge (Audit Scotland, 2015, p36).

It is clear that some of the staff with key skills and knowledge who were lost to the sector were also sustainability champions, which I found to be further corroborated when some of the positive relationships I had forged at some colleges subsequently disappeared post-merger. This throws up the question – are these champions of an advocacy style model of sustainability vulnerable, especially at a time of unrest – if they are the members of staff who disappeared? It has certainly been established in the past, with other such initiatives, for example Education for Citizenship, that the weakness with advocacy style models are their vulnerability, and the model arc can be broken, particularly in the early stages, whereby ‘advocacy is a potentially risky role to adopt’ (Mallik, 1997, p130).

All of this evidence also demonstrates how difficult it was to get the survey completed. The fact that so many college Principals chose to either ignore the survey, or forwarded it to another member of staff but did not then check if it had been completed, may indicate that ESD is not considered a high priority in times of radical change. Even though it was advised the SFC endorsed the survey and it was issued by the EAUC, Principals still did not reply. However, to be fair, this research was conducted ‘against the financial backcloth of the college sector undergoing its most significant change since incorporation; a governance review and regionalisation agenda creating merged and federated institutions where regionalised negotiated outcome agreements between colleges and the Scottish Funding Council are the drivers for funding’ (David Hume Institute, 2012, p2).

I believe the reasons the survey was not completed and returned may be attributable to some or all of the following points. These reasons will be discussed in this and the following Chapters.

- The Principal was too busy crisis managing.
- The Principal did not consider ESD important.
- The Principal had other more pressing local concerns, such as the college mergers.
- The Principal delegated the task but did not then check to see if it had been completed which raises questions of organisational and line management function.
- The Principal was overloaded by survey requests so tended to ignore them.
- The Principal, or delegated staff member, did not feel confident enough in their ESD knowledge to complete it.

However, I do want to make clear at this point as a practitioner enquirer, that the poor response rate does not invalidate the pockets of positive work concerning sustainability of which I am aware in these colleges. There are a number of projects that I have either directly observed, or to which I have been introduced at various important college and sustainability events. However, it should also be noted that a significant proportion of these projects are often linked to extra-curricular activities, and may not be considered as embedded within the curriculum.

I know if I had requested the survey be completed by my own contacts within colleges I would have had greater success, because I believe most, if not all of them, would have completed and returned the survey. Most of these contacts are ‘sustainability champions’ within their own institutions and are individuals with whom I have directly worked. However, I made a conscious decision at this juncture not to send the survey directly to my own contacts, and to restrict the requests to college Principals only, because I wished to measure the importance of ESD at the very top level of college management. Much literature (Blewitt, 2015; Egri & Herman, 2000; Parkin, 2010) has demonstrated the centrality of a strategic leadership commitment to the effective realisation of ESD objectives. In the event of Principals delegating completion of the survey to a named member of staff, I exercised latitude in construing this managerial choice as at least a potentially viable model of strategic engagement reflective of some degree of systemic embrace of the sustainability ethos within the college.

To date, there has been no large scale survey of sustainability in Scottish tertiary education – covering both FE and HE – and evaluations in tertiary education tend to be sporadic and in isolated pockets in relation to specific sustainability initiatives. For example, the Green Academy Programme launched by the Higher Education Academy in 2011 to assist universities in embedding ESD into the overall student experience, was evaluated in 2012 and again in 2013. Neither was a comprehensive evaluation, confirmed by the first attempt concluding that ‘examples where sustainability has been developed and implemented were rare, partly because curriculum reform was often still at the planning stage’ (McCoshan & Martin, 2014, p3). The second attempt only covered seven universities in England and Wales and can therefore not be considered comprehensive either.

Prohibitive factors highlighted by these evaluations clearly also exist in Scottish college education, where ‘there is a lack of yardsticks against which to measure progress, not least because each institution should largely be judged in its own terms against its own plans’

(McCoshan & Martin, 2014, p3). Determinations such as these only serve to compound how difficult it is to conduct an effective survey, which accurately reflects the position within individual colleges.

Both of the Green Academy Programme evaluations surmised that ‘the small scale of resources [made available for ESD] probably reflected the difficult financial circumstances of the time’ and furthermore that ‘certainly these difficulties have continued’ (McCoshan & Martin, 2014, p6). I concur wholeheartedly and have had this confirmed to me as a barrier in a number of discussions with staff. Furthermore, I would progress this argument further that the ‘difficult financial times’ in Scottish FE against which this research was conducted in, further fuelled this situation and added to the struggle of obtaining information from college Principals when they had more compelling issues with which to contend. This confirms my view that there remains a stark contrast between the strategic ambitions of Scottish Government in embedding learning for sustainability across all levels of education – primary, secondary, tertiary and community – and the resources that are actually devoted to it. Wals (2014) reported that ‘the current financial crisis affects many regions of the world which also influences university operations’ (p11). Not only university operations have been effected by financial concerns, globally and in Scotland, but FE has also borne the brunt of financial constraints and continues to do so. Indeed, it is possible to argue that even in an education system in a flourishing economy; it would still be difficult to devote to colleges the resources required to match the highly ambitious policy desires on paper.

## **Survey Findings**

The results of the survey are presented in two parts as follows.

1. Level of awareness of ESD at a strategic level in the college. This includes opinions of ESD and the guidance available for reference to implementing it, and also the ESD progress made to date within the college. The survey’s findings are also compared against individual colleges own strategic sustainability and environmental policies, where they exist in an accessible manner.
2. Senior staff opinions and use of the ESD learning and teaching materials I have developed. (Chapter Five).

**Part One: Level of awareness of ESD at a strategic level in the College**

- 1. Do you refer to any of the following policy document, resources or institutions for guidance on ESD? Please tick all that apply.**

*Table 4.3 - Documents/Institutions Referred to for ESD Guidance*

<b>Answer Choices – Total Responses: 8</b>	<b>Responses</b>	
<b>Learning for our Future (Scottish Executive, 2006)</b>	<b>3</b>	<b>37.50%</b>
<b>Learning for Change (Scottish Government, 2010)</b>	<b>2</b>	<b>25.00%</b>
<b>UNESCO</b>	<b>1</b>	<b>12.50%</b>
<b>Colleges Scotland</b>	<b>5</b>	<b>62.50%</b>
<b>Education Scotland</b>	<b>5</b>	<b>62.50%</b>
<b>Scottish Funding Council</b>	<b>3</b>	<b>37.50%</b>
<b>Environmental Association for Universities and Colleges</b>	<b>3</b>	<b>37.50%</b>
<b>I do not refer to any resources for guidance on ESD</b>	<b>1</b>	<b>12.50%</b>
<b>Other</b>	<b>0</b>	<b>0%</b>



**2. How do you rate their effectiveness in guiding your ESD decisions? (Referring to policy documents, resources or institutions referred to for ESD guidance).**

*Table 4.4 - Effectiveness of ESD Guidance*

<b>Answer Choices – Total Responses: 8</b>	<b>Responses</b>	
<b>Very effective</b>	<b>2</b>	<b>25.00%</b>
<b>Quite effective</b>	<b>4</b>	<b>50.00%</b>
<b>Of little effect</b>	<b>1</b>	<b>12.50%</b>
<b>Not effective at all</b>	<b>1</b>	<b>12.50%</b>

The survey found that colleges are referring mainly to Colleges Scotland and Education Scotland for guidance on ESD delivery within their institution (Table 4.3). They are also referring to the Scottish Funding Council and the Environmental Association for Universities and Colleges, but to a lesser extent (Table 4.3). It is encouraging that *Learning for our Future* (Scottish Executive, 2006) and *Learning for Change* (Scottish Government, 2010) have also been referred to by some colleges (Table 4.3), which may indicate that if the Scottish Government were to advocate specific learning for sustainability policy for the college sector, rather than just guidance, it would be embraced. Of the colleges who responded only 25% found these documents and institutions to be very effective, whilst a further 50% found them to be quite effective (Table 4.4). Although it is difficult to draw generalisations from the number of responses, I have had staff at all levels advise the very same thing to me personally. Until there is definitive legislation in place, governing learning for sustainability within college education, the delivery will continue to be patchy, not only across the sector as a whole but also within individual colleges. This is not only a problem in Scottish FE. The General Assembly of the United Nations ‘acknowledges there is a need to further mainstream sustainable development at all levels’ (United Nations, 2012, p2). This concept of ‘mainstreaming’ is vital in sectors where sustainability is vulnerable to other pressures, or where it relies upon a small cadre of enthusiasts. The sector’s tendency to rely upon, and adhere to legislation is of course a mixed blessing. As well as signalling a potentially worrying dependence on hierarchical styles of planning, it also raises questions about the sincere moral and institutional embrace of ESD. In other words, there is a danger ESD will be engaged with superficially because

institutions have been told they have to do so, without the required step-change in culture which is required to be truly considered a sustainable organisation. In these circumstances legislation may not be a good thing.

Wals (2014) recognised that ‘the promotion of ESD in higher education is considered crucial to building a sustainable future and to placing young people at the centre of development’ (p12). This is equally important in Scottish FE, which is responsible for educating a large percentage of Scotland’s future workforce. Furthermore, Scottish FE also plays an important part in local communities and has opportunities for influencing the mind-set of older students who attend for additional qualifications, or for continuous professional development as part of their existing employment, or purely for recreational purposes. All of these openings to engage with students should be exploited in order to create a sustainable future, by ensuring that learning for sustainability is evident across the college campus and curriculum as a declared and actual value. However, whilst sustainability incorporated into work-related and recreational learning is important, it should also be recognised that ‘there is a need for distinction between sustainable development competence (e.g. citizen’s capacities to contribute to sustainable living both professionally and personally) and ESD-competence (e.g. an educator’s capacity to help people develop sustainable development competence through a range of innovative teaching and learning practices)’ (Wals, 2014, p13). Without effective guidance, which will need to be driven by an authority to which the colleges will properly attend, such as Colleges Scotland, it is difficult to incentivise educators in large numbers to acquire the skills and knowledge required to enable them to become competent sustainable development educators. This may indeed be a structural weakness of the sector, if instructions are always needed.

When evaluating the practical guidance that is available for the FE sector in Scotland, it would appear that in learning for sustainability terms it has been overlooked to a certain extent. There are specific policy initiatives in place for schools, such as *Curriculum for Excellence* (CfE), with learning for sustainability embedded. *Curriculum for Excellence* now has sustainability at its core, covering it in topics such as food and health, in relation to people, place and environment, within technology skills and knowledge and also referring to planet earth and energy sources, to name but a few (Education Scotland, n.d.). *Curriculum for Excellence* ‘aims to achieve a transformation in education in Scotland by providing a coherent, more flexible and enriched curriculum from 3 to 18’ and ‘includes the totality of experiences which are planned for children and young people through their

education, wherever they are being educated’ (Education Scotland, n.d.). However, early evidence suggests that these ideals are translating better into primary education. This may be because CfE has interdisciplinary learning at its core and ‘primary teachers are perhaps better equipped than secondary teachers to employ techniques suited to interdisciplinary studies’ (Humes, 2013, p88):

This is because they have been trained to work across the curriculum and are used to structuring their teaching in ways that draw attention to links between different subjects. They are also responsible for the early development of literacy and numeracy which are so fundamental to understanding in all areas of the curriculum. The fact that children remain with the same teacher for most of the school day is an additional advantage which primary schools have over secondaries (Humes, 2013, p89).

If it has been found that embedding CfE is problematic at secondary education level, then interdisciplinary learning is equally, or even more difficult, in FE where the teaching structure can be just as fragmented and siloed.

Not only has Scottish primary and secondary education had the formal ESD friendly curriculum overhaul provided by CfE, it also has the highly successful – particularly in primary education – Eco-Schools movement and the Green Flag awards which aid successful ESD. Furthermore, the One Planet Schools initiative has received government approval, whereby sustainability issues are tackled through a whole school approach integrating ESD, Global Citizenship and Outdoor Learning. Again, this is another effective model that could be utilised within college education in Scotland. The One Planet Working Group also recommended all teachers needed to address learning for sustainability in their teaching. This has now been adopted by the independent professional regulatory body, the General Teaching Council for Scotland (GTCS), which has revised its professional standards. The inclusion by the GTCS of learning for sustainability, not only as an attribute of effective teaching, but also as a core underpinning value, is of potentially immense significance because it commits the profession in all of its forms to the support and implementation of learning for sustainability. This is, as UNESCO has pointed out, ‘a significant development that will require a national commitment to pre-service and in-service training of all members of the profession’ (UNESCO, 2013, p8). Nevertheless, the scale and profile of the value incentivises its adoption and expression across the Scottish teaching body. There is no GTCS equivalent

in FE, however should one be implemented, FE could learn lessons from the GTCS's adoption of learning for sustainability as a core value.

All of these successful initiatives were recognised by the United Nations, which believes that Scottish education has 'a greater focus on a more integrated and coherent approach to sustainable development and ESD with education being recognised by policy makers and practitioners as a key enabler in the transition to a sustainable society' (UNESCO, 2013, p4). It seems clear that where policy makers have focused on specific areas of education and delivered initiatives such as CfE and the Eco-Schools programme, the progress made in learning for sustainability has been extremely encouraging.

A number of factors impede the translation of these gains to Scottish FE, such as:

- Insufficient ESD practice.
- Lack of support from college management.
- Official guidance is erratic and the sector appears to rely on individual initiatives.

However, because there are insufficient ESD practitioners to overcome these impeding factors, it is unlikely the initiatives above will become a reality across the board in Scotland's Colleges in the near future. Moreover, if these initiatives were developed further for FE, then college Principals would have clear instructions and would know exactly where to refer to in order to embed learning for sustainability within their college, instead of the fragmented picture shown in Table 4.3. Furthermore, definitive initiatives may prove more effective than the guidance currently available (Table 4.4).

Looking beyond what is available to direct learning for sustainability in college education, the account again in HE is more encouraging and there maybe examples from which FE can learn. There is guidance available from the Higher Education Academy and the Quality Assurance Agency addressing sustainability which can be evidenced by:

We are pleased to have co-convened the development of this important guidance document in partnership with the Quality Assurance Agency for Higher Education (QAA). We have a rich heritage in education for sustainable development having supported and produced influential documents and research reports that have helped shape education for sustainable development in the higher education sector (Higher Education Academy and Quality Assurance Agency, 2014, p3).

The lack of legislation and political direction is at odds with the student requirement to attain sustainability knowledge (Drayson, 2015). Research conducted by the National Union of Students and supported by the Higher Education Academy over the last 5 years with students across the UK has established ‘that over 80% of students want their institution to be doing more on sustainable development and over 60% of students want to learn more about sustainability’ (Drayson, 2015, p3). Nevertheless, the reality is ‘that the reorientation of higher education towards comprehensive inclusion of ESD is making slow progress across the sector as a whole’ (Drayson, 2015, p5). Furthermore ‘significant leadership is needed at all levels within the UK’s education system to encourage and achieve wider adoption of ESD’ (Drayson, 2015, p5). Drayson (2015) has therefore established that where leadership has been measured in sustainability education in the UK, it has been found to be lacking even in an area of supposed strength such as universities. These vulnerabilities are also evident in Scotland’s Colleges, where leadership is required, not only internally but across the governmental agencies responsible for shaping FE policy and ensuring ESD is on the Scotland’s Colleges’ agenda.

The lack of available and effective guidance is not only an issue in Scottish FE, or indeed education across the board in the UK, but also in other developed countries. A study in the USA found that a lack of appropriate tools to guide curriculum development hampered efforts to design sustainability programmes in schools. This was evidenced by Warner and Elser (2015) who reported that ‘environmental educators and school administrators realize the importance of solution-based education, but they have few tools to guide their efforts in designing sustainability programs in schools’ (p2).

As previously indicated, where colleges look to external sources of governance and guidance they are more inclined to intend Colleges Scotland and Education Scotland (Table 4.3). Thus it could be argued that these institutions have more power for driving learning for sustainability in Scotland’s Colleges than is currently acknowledged. Clear guidance is certainly imperative because ‘to integrate sustainability-oriented learning in an entire system has already shown to be quite a challenge in many schools, universities and companies alike’ (Wals, 2014, p14). This challenge is pervasive in college education and double difficult to confront at a time of ‘concurrent educational reforms towards efficiency and accountability means it is not conducive for such a re-orientation’ (Wals, 2014, p14). Direction and re-orientation need to come from an authority to which the colleges will listen if there is to be genuine and lasting policy change of the kind for which Principals are accountable. To achieve this objective, many commentators believe that it will be

‘essential to develop an overarching UK Strategy for sustainable development which sets out a clear vision about the contribution learning can make to its sustainable development goals’ (Martin, *et al.*, 2013, p1537). Even accepting the autonomy of the Scottish system the point holds that the formulation of vision must come from the key political actors if college Principals are to be supported and motivated to change.

A further problem with the survey was of course self-selection i.e., that the colleges which did respond are likely to be those that are addressing ESD, or at least have it on their strategic radar. The colleges that chose to ignore the survey may have done so because they believed they have nothing positive to report, which may be accurate, or which may be a reflection of unconfident Principals in their perception of their own institutions. Indeed, where Principals did react in this way it is perfectly conceivable that they were unaware of areas of successful ESD work in the curriculum, or insufficiently conscious of the ESD ethos in rapidly changing or indeed merged institutions. Another reasonable conjecture is that some colleges already responsive to the best quality external guidance and documents have already begun to move beyond this level of compliance to something more sophisticated and advanced (Table 4.4). This does not invalidate the importance of good national guidance, but it does recognise that colleges faced with intense external pressures and rapid internal change, may be at varying stages of the ESD journey, of which even newly appointed Principals are incompletely informed.

Even in those cases where colleges advised that they do refer to policy documents, resources or external agencies for guidance on ESD (Table 4.3), it is important to underline that there has been no formal audit conducted across Scotland’s Colleges to establish if these claims are in fact correct. It is noteworthy that Scotland’s Colleges are also signatories to the EAUC’s Universities and Colleges Climate Commitment for Scotland (UCCCCfS), whereby they are required to report their carbon emissions with an aim to reducing emissions as well as providing modules and courses that address the challenges posed by climate change. Again, there is no audit element to the UCCCCfS to ascertain if these objectives are actually being attained. This weakness is not unique to FE. It is also apparent in HE where, despite a number of initiatives which institutions have committed to – including declarations, charters and conferences – which all provide supporting guidance, there is nothing to ‘ensure that the signatory institutions implement sustainable development within their systems’ (Lozano *et al.*, 2013a, p18).

The absence of audit on a scale commensurate with the ambitions of ESD is a problem. If guidance is not monitored or indeed adhered to, we may ask is it because the ‘guidance is not prescriptive about how education for sustainable development should be delivered, because it recognises that educators will have their own ideas, will be working within distinct local and national contexts, and will be influenced in most cases by broader institutional strategies’ (HEA & QAA, 2014, p7). There are compelling arguments that prescriptive guidance would be more successful in Scottish FE in supporting the very clear requirement of e.g., *Learning for Change* (2010) and the UCCCfS. Guidance is not matching the performance of prescriptive regulation. This was starkly confirmed by one college Principal who stated in the research that if Education Scotland or the Scottish Funding Council told him he had to ensure ESD was embedded across the curriculum then he would.

The lack of legislation driving ESD in Scottish tertiary education is not a new concern. Even prior to the UNDESD, non-governmental organisations (NGOs) highlighted concerns that the emerging legislation, which would become the Further and Higher Education (Scotland) Act 2005, made no mention of sustainable development or ESD (Watson, 2015). To address this deficit, NGOs and Members of Parliament worked successfully to amend the proposed legislation and had the following text included:

In exercising its functions, the [Scottish Funding] Council is to (a) have regard to the desirability of the achieving of sustainable development; and (b) in particular, encourage the fundable bodies to contribute (so far as reasonably practicable for them to do so) to the achievement of sustainable development (Further and Higher Education (Scotland) Act 2005, s20(a)).

As a result of this, the SFC has funded a number of initiatives to further ESD progression in Scottish tertiary education. One such project was the ESD in the Scottish College sector project on which I acted as a Project Consultant, firstly employed by Scotland’s Colleges and then in the second half of the project by the EAUC. It was this project that enabled me to gain access to colleges in order to pursue this research and also to further my experience as an ESD practitioner. Funding for the ESD in the Scottish College sector project has subsequently ended. The SFC also funds the EAUC’s UCCCfS initiative. However, ‘the tactics that created successful pilot programmes are different than the tactics and strategies necessary for expanding those pilots into policy and mainstream practice’ (Hopkins, 2015, p135). Hopkins (2015) also questions the extent to which successful pilot programmes can

be documented in a manner which supports their wider implementation, especially in relation to those who have the mentoring skills to assist others to replicate programmes. Furthermore ‘in some cases, documentation of successful programmes does not exist and there is no funding to provide mentors to others who desire to replicate a programme’ (Hopkins, 2015, p135). Moreover, Hopkins’ important allusion to mentoring raises another area of both great potential and considerable challenge, that an effective mentoring scheme could make a marked difference to the effective dissemination of ESD awareness and commitment in an institution. This would require leadership, training and financial resources that may not be forthcoming. However, ‘if we are to increase the number of graduates with capabilities in sustainability, we need to allow for the development of academics with the pedagogy, knowledge and skills to develop sustainability-related courses’ (Holdsworth & Thomas, 2015, p9). All of this suggests, that because funding is no longer available from the SFC for the ESD in the Scottish College Sector Project, any progress made to date will be difficult to maintain.

During 2011 the *Professional Standards for Lecturers in Scotland’s Colleges* (Morrison, 2012) were revised. There was significant input into this process from the SFC and other members of the ESD community and the revised Professional Standards came into effect in March 2012 (Watson, 2015, p93). From that date there is an expectation that ‘the [college] lecturer should be able to: Plan strategies to promote sustainable development’ (Morrison, 2012, p9). It has been argued by Watson (2015) that ‘Scotland also has a concerted and wide-ranging programme of policy change and support in place to ensure that ESD in colleges, universities, and in Community Learning and Development matches the progress that has been achieved in schools’ (p93). Watson (2015) is certainly correct in key respects, she is right that the key aim is for FE and HE to achieve the same level of ESD success achieved in schools. However, as this research has shown, this is not the actuality in all of Scotland’s colleges. The *Professional Standards for Lecturers in Scotland’s Colleges* is all well and good in theory, but in reality it appears to be putting the pressure on lecturers to promote ESD, but without the active regulated support and mentoring systems that ought to be driving college management teams.

There have indeed been developments in Scottish FE to promote learning for sustainability within lecturers’ practice and ‘there are many developments taking place which are pushing ESD up the higher education agenda, many ESD practitioners in the UK and further afield believe that genuinely transformative ESD requires more radical and fundamental change, which goes beyond ‘*integrating*’, ‘*embedding*’ or ‘*mainstreaming*’



sustainability within HE' (Bessant *et al.*, 2015, p418). However, this progress does not alter the fact that reorienting curriculum design still does not go far enough (Holdsworth & Thomas, 2015) and still does not command the necessary interest and leadership of the college Principals. A further requirement for success is the need to develop academics so that they can engage systematically and committedly with sustainability education and be in possession of the skills and capabilities to deliver it in an open-minded and participative fashion (Cotton *et al.*, 2007). However, because 'lecturers hold differing conceptions of sustainable development, and this implies different strategies for incorporating sustainability into the curriculum' ... 'there is no one 'correct' conception of sustainable development, or pedagogic approach' (Holdsworth & Thomas, 2015, p8). Furthermore, Corney and Reid (2007) emphasised that the ability and capacity to address sustainability education depends not only on teachers' knowledge and beliefs about the subject matter but also about pedagogy. The presence of different beliefs and approaches make comparisons between colleges difficult, even when information can be obtained, let alone when the information is not forthcoming. What is required is unity and diversity at the same time. Colleges are different and should have different approaches, just as nations are different and have different concepts of sustainability, however it should still be possible to have diversity but with a unified vision of what learning for sustainability should achieve.

### 3. How much of a priority do you consider ESD to be within your institution?

(Please tick the most appropriate answer).

**Table 4.5 - Level of ESD Priority**

Answer Choices – Total Responses: 8	Responses	
Highest priority	0	0%
High priority	5	62.50%
Medium priority	1	12.50%
Low priority	1	12.50%
No priority	1	12.50%
Other (please specify in text box below)	0	0%

Although the number of survey respondents was low, it is encouraging that over 60% of those who did respond advised ESD is considered a ‘high priority’ within their college (Table 4.5). Interpreting this more subtly however, it could be that colleges who have confirmed ESD is a high priority are then more likely to respond to a survey measuring ESD. The majority of colleges failed to respond to the survey, and it has to be considered that one potential reason for this is because they do not consider ESD important enough to comment on. One college did advise ESD was of ‘no priority’ which appears to be confirmed later in the chapter when I evaluate the transparency of available sustainability and environmental policy documents from the survey respondents.

Colleges may not consider ESD important if they believe the key organisations that guide their practice, such as College’s Scotland (now College Development Network) and the Scottish Funding Council do not consider it is significant enough to be a key outcome or objective. John Henderson, who was Chief Executive Officer at Scotland’s Colleges at the time, asked The David Hume Institute to conduct research, and report on the role of the college sector within the Scottish labour market and wider economy in 2012. The subsequent report makes no reference to sustainability; it does however mention citizenship and social inclusion (The David Hume Institute, 2012). The David Hume Institute did not report that sustainability or sustainable development were important within the Scottish labour market or the wider economy, and Scotland’s Colleges did not request sustainability to be considered or question its omission from the report. Furthermore, the report highlighted that FE funding, particularly for teaching, has declined in recent years and that funds received from Government will be substantially lower in 2013-14 than 2012-13. Funding reductions will have left Scotland’s Colleges and college Principals with difficult decisions to make, and further work on learning for sustainability may have suffered as a result.

The Strategic Plan for College Development Network 2013-15, does not include sustainable development in its strategic objectives explicitly either. It may be included implicitly, for example by ‘guiding and support for learning and teaching, including *Curriculum for Excellence*’ and to ‘support local dialogue on specific national, regional and local curriculum issues’ (College Development Network, n.d.), which could both have sustainability connotations. I do believe though that in many cases, college senior management teams will not afford learning for sustainability the priority it requires unless they are explicitly told to. However, I believe this would be the case with any new initiative that entails curriculum redesign, and is not only specific to learning for

sustainability. For example, the Scottish Executive and the Scottish Consultative Council on the Curriculum (now Learning and Teaching Scotland), first discussed education for citizenship in 1999, however when I started working in FE in 2007, I still remember this being a contentious issue.

One explanation of why sustainability may not be considered a priority, or a high priority, (Table 4.5 and by lack of response) may be because ‘implementation of an innovation, such as sustainable development, is more troublesome when the adopter is an organisation rather than an individual, especially if the innovation is an abstract idea’ (Rogers, 1995 cited in Lozano *et al.*, 2013a, p11). Additionally, though there are a number of guidelines now in place, ‘sustainable development could still be considered as radical in different universities [and colleges] and radical innovative ideas will undoubtedly face resistance when being incorporated and institutionalised’ (Lozano, 2006, p790, brackets mine). It was put forward by Rogers (1995) that some HE departments, or the university as a whole, would fall into one of the following adopter categories – *innovators*, *early adopters*, *early majority*, *late majority*, or *laggards* (Rogers, 1995 cited in Lozano *et al.*, 2013a, p11). This argument could also be applied to Scottish colleges – where there are a number of major initiatives in place – that some are innovators and early adopters with the rest being the late majority and laggards. The colleges that took part in the survey may therefore largely be the innovators and early adopters and other colleges may not have replied if they belong to the late majority or laggards. To overcome the resistance of incorporating a radical innovative concept such as sustainable development it ‘should be done incrementally and with the participation and empowerment of all the stakeholders to reduce the resistance to change and the appearance of unnecessary conflicts’ (Lozano, 2006, p796). However, colleges may be naturally cautious of change, even when incremental because ‘colleges operate within narrow financial margins, where relatively small changes can turn planned surpluses into deficits and deficits into surpluses’ (Audit Scotland, 2015, p31). Moreover, as learning for sustainability can be considered an abstract idea, it may be difficult for institutions to see what return they are getting on their investment. Colleges need to see their external stakeholders pushing an agenda in order to engage with it. Once employers, industry and commerce demand a skill it will be incorporated, otherwise there is no incentive to do so. Just like the anti-racism agenda was pushed and everyone had to do it, so attitudes started to change, or like Education for Citizenship which was incentivised in the beginning and is now part of the fabric.

If ESD does not appear to be a priority in FE – or a number of colleges appear to be laggards – progress within Scottish schools is far more promising, and was identified by Education Scotland in response to the UNDESD. Education Scotland states in *Conversations about Learning for Sustainability* that ‘from a policy perspective there is much to be optimistic about as Scotland seeks to build on all that has been achieved over the last 10 years and sets its sights on another decade of progress’ (Education Scotland, 2014, p3). Education Scotland did not include FE in this report, and the study only involved Scottish schools and pre-school education. This encouraging ‘policy perspective’ now needs to be continued into Scottish college education. The report also recognised the ‘biggest achievements within the school sector have been embedding global citizenship and sustainable development education as themes across learning within the new national curriculum, *Curriculum for Excellence*’ (Education Scotland, 2014, p3). Quite clearly the same level of success has not been achieved in Scotland’s colleges and although Scotland has embraced the opportunity of the UNDESD by producing *Learning for the Future* (2006) and *Learning for Change* (2010), neither of these documents appears to have translated into practice to a great extent within FE.

Reasons for resistance to ESD in tertiary education have been raised in previous chapters; however, it is important to bring these to the fore again in response to the answers supplied. The resistance in universities to engaging with sustainable development has been well documented – such as lack of expertise, over-crowded curriculum and perceived relevance (Cotton & Winter, 2010; Scott & Gough, 2004; Dawe *et al.*, 2005; Lipscombe, 2008). Whilst these reasons for resistance to ESD have not hitherto been researched to any great extent in Scottish FE, it seems clear that similar factors prevail in Scotland’s Colleges in general.

It has already been stressed that for learning for sustainability to be successful the re-orientation of the higher education curriculum is required (Sterling, 2004). However, in relation to HE ‘the idea of the university as an ivory tower is eroding and being replaced by the idea of a university that serves the community of which it is part’ (Wals, 2014, p10). In many respects, colleges may be ahead of universities in this key respect, because they are often active partners in community initiatives and necessarily networked to a whole range of stakeholders intimately connected with their educational mission. The college where I work regularly has students working with community partners, two recent extra-curricular examples include, students collecting blankets for use by the Dog’s Trust, and an ongoing project by the colleges Student’s Association and the Dumfries branch of Lesbian,

Gay, Bisexual, and Transgender Youth Scotland to tackle homophobic concerns within the college. Owing to the work I have been involved in, and the many initiatives of which I am aware of at other Scottish colleges also, I have direct experience of college-community collaboration being successful in Scotland, particularly by linking the formal and informal curriculums. This has also been evidenced by research in HE by Lipscombe, (2008), and I believe this link will prove to be a powerful tool in colleges transformation to becoming more sustainable organisations. This makes me feel positive that although most colleges did not respond to a survey regarding ESD, by the very nature of the work they undertake within their local communities, they are oftentimes engaging with learning for sustainability by default and through the ongoing discharge of their educational responsibilities. However, engaging by default is still not enough, and students need to be made aware these initiatives are part of the bigger sustainability agenda.

**4. Have you audited ESD practice across the curriculum and/or in relation to your Sustainability Policy?**

***Table 4.6 - ESD Audit***

<b>Answer Choices – Total Responses: 5</b>	<b>Responses</b>	
<b>Yes</b>	<b>3</b>	<b>60.00%</b>
<b>No</b>	<b>2</b>	<b>40.00%</b>

Table 4.6 indicates only three colleges which completed the survey had audited ESD practice across the curriculum and/or in relation to their Sustainability Policy. However, one of the skipped responses also advised they were in the process of auditing ESD, which means a total of six colleges answered the question.

5. How well embedded is ESD in the curriculum in your institution? (Please tick the most appropriate answer).

*Table 4.7 - How well is ESD Embedded*

Answer Choices – Total Responses: 7	Responses
ESD is very widespread in most departments	2 28.57%
ESD is quite widespread in a number of departments	2 28.57%
ESD is not very widespread and is only embedded in a few departments	3 42.86%
ESD is not embedded at all	0 0%

**Table 4.8 – ESD Comparison across Colleges**

<b>College</b>	<b>ESD Priority (High/Med/Low/No Priority)</b>	<b>ESD Audited (Yes/No/Other)</b>	<b>ESD Embedded (Very/Quite/Not Very/Not Embedded)</b>
<b>College 1</b>	High Priority	No	Not very widespread, only embedded in a few departments
<b>College 2</b>	High Priority	Underway	Quite widespread, embedded in a number of departments
<b>College 3</b>	High Priority	Yes	Very widespread, embedded in most departments
<b>College 4</b>	High Priority	Yes	Quite widespread, embedded in a number of departments
<b>College 5</b>	No Priority	Skipped	Very widespread, embedded in most departments
<b>College 6</b>	High Priority	Yes	Not very widespread, only embedded in a few departments
<b>College 7</b>	Medium Priority	No	Not very widespread, only embedded in a few departments
<b>College 8</b>	Low Priority	Skipped	Skipped

From the comparison across colleges provided in Table 4.8, of the colleges that advised ESD was high priority, all but one had either audited it across the curriculum, or were in the process of doing so. Only one college that advised ESD was high priority had not conducted a curriculum audit (College 1). However, of these colleges only College 3 advised ESD is very widespread. Out of the remaining colleges that considered ESD to be

high priority, two colleges advised ESD was quite widespread (Colleges 2 & 4) and two replied that ESD was not very widespread (Colleges 1 & 6). Three colleges answered that ESD was not high priority (Colleges 5, 7 & 8) – these colleges considered ESD was either medium, low or of no priority – one confirmed they had not audited ESD across the curriculum (College 7) and two colleges chose to skip the question (Colleges 5 & 8). Oddly, College 5 advised ESD was given no priority in their institution, they did not advise if they had audited ESD across the curriculum but skipped the question. However, they did advise that ESD is well embedded in the curriculum and is very widespread in most departments. Of the two colleges that stated ESD is very well embedded (Colleges 3 & 5), I know this to be the case in College 3 because I have seen many examples of positive ESD work, both within their institution and as a result of interactions with their staff at external events. However, I have never connected with College 5, either as part of the Scottish College ESD Project where I have provided support and staff development at a number of colleges, or at any external ESD events hosted by Scotland's Colleges, the EAUC or College Development Network.

In order to embed ESD calls have been made for a more transformative whole systems response which places sustainability at the heart of higher education's 'raison d'être' (Sterling, 2013, p18). However, 'a real concern for sustainability educators here is that these sorts of changes could negatively impact upon the continued uptake of degree courses focusing on sustainability, which may be seen as 'soft', 'fuzzy' and not as explicitly linked with the typical graduate job market' (Bessant *et al.*, 2015, p424). If this is the case it is not only the transformation of education that is required but as Jucker (2014, p38) points out, 'There is no real progress in the sense of the necessary paradigm change ... ESD is only possible with a radical paradigm change'. A possible radical paradigm shift could then support the 'significantly growing discourse area in the ESD world [which] involves drawing direct linkages and synergies between ESD and the student employability, skills and consumer rhetoric' (Bessant *et al.*, 2015, p424). Examples of this growing discourse are first Keele University which offers a module to all first year students entitled: 'Greening Business: Employability and Sustainability', and secondly Exeter University which advertises a range of 'SUSTAINability' modules through emphasis on students enhancing their employability skills by undertaking the modules' (Bessant *et al.*, 2015, p424).

The action of providing an introductory learning for sustainability module utilising sustainability knowledge as an employability skill could work well within Scotland's



Colleges and would potentially provide the impetus to make ESD higher priority (Table 4.5) and aid embedding ESD across all college departments (Table 4.7). The learning for sustainability materials I have developed embrace this approach and where they have been utilised the feedback has been positive. However, ‘often ‘sustainable development’ is just another course or research project as expendable as anything else if it does not pay its way’ (Wals, 2014, p11). Worryingly, although as Walton (2014) suggest, ESD may be the driver that is required for ‘creating an ecologically sound, socially just, humane and healthy global society’ (p449). He does worry though that ‘the only question is, will this shift happen fast enough’ (Walton, 2014, p. 449). This research strongly suggests that the pace of change is not only slow, but its direction is erratic and unsure.

It is not surprising then, that despite any advances made in ESD, many commentators believe that tertiary education is a long way from reorienting itself towards sustainability and that a wholly new approach is required (Blewitt, 2015). Pongiglione (2015) suggests that the United Nations are implementing a new ‘systems’ approach by adopting and aggressively supporting the Sustainable Development Goals (SDGs) – which are replacing the Millennium Development Goals (MDGs) – because the SDGs ‘put emphasis not only on the goals themselves, but also on how they have to be achieved’ (p37). It may indeed be the case that the SDGs can help deliver opportunities for a new approach within education because they provide a much more dynamic and ambitious range of goals with which to drive and motivate the active pursuit of sustainable practices. Pongiglione (2015) further states:

This new approach has the merit of putting a central focus on a very basic fact: any form of economic development that is not built on a sustainable use of resources and that does not consider climate change as an urgent and dangerous issue is fundamentally misguided. Such development represents fleeting economic growth based on resource exploitation that not only is likely not be sustainable over time, but may also prove detrimental to the well-being of future generations (p37).

These insights further reinforce the argument that it is imperative that *all* levels of education must treat ESD as high priority whilst there is still time to do so. Moreover, ‘education is also one of the means for achieving other objectives that represent serious and urgent challenges for the contemporary world that are not only SDGs, but also fundamental ethical requirements’ (Pongiglione, 2015, p38).

The radical systems shift envisaged and promoted by many influential agencies and commentators once again runs into the intrinsic time lags which inevitably retard educational innovation. On the one hand, whilst it is important ESD be given high priority sooner rather than later, it also needs to be acknowledged that it takes time to embed once it is addressed strategically. The gain is that when change happens over long enough periods, and over time is adopted by more of an organisation's staff, and therefore becomes widespread and stable, it is no longer an innovation but part of that organisation's culture (Rogers, 1995). This is in my estimation the radical systems change that is required in Scottish college education. There is a need to move beyond enthusiastic but heavily individualised 'sustainability champions' and ESD projects, to a stage where learning for sustainability is seen as integral to a college's norm – creating new sustainable paradigms, both within the curriculum and beyond in *all* college activities. For colleges to become sustainability leaders in Scottish society, every member of staff, from the Principal and those responsible for curriculum design and teaching, to the newest recruits, must have the power and knowledge to engender change. Lozano *et al.*, (2013a) advised that;

university leaders and staff must be empowered to catalyse and implement new paradigms, introducing sustainable development into all courses and curricula and all other aspects of university and college activities, thereby ensuring that sustainable development is the 'Golden Thread' throughout the entire university system (p18).

Those responsible for providing the empowerment to Scottish college education must take heed and act, because only then do I believe ESD will be recognised and implemented with the level of priority required.

**6. What processes, if any, do you have in place to develop ESD in the curriculum?**

***Table 4.9 - Processes to Develop ESD in the Curriculum***

<b>College</b>	<b>Processes</b>
<b>College 1</b>	I am only responsible for ESD in one college department and I am currently working to better our sustainability, but I feel we don't get enough support when asked, not from our department but others.
<b>College 2</b>	We have developed curriculum specific materials for ESD and continue to do so and our Sustainable Development Adviser (SDA) has worked on staff development. ESD is central to our Carbon Management Plan and we have an Energy Focus Group with a Sustainability Group which is currently being put in place. The SDA also works closely with the Student Association to assist them in the National Union of Students pilot programme Responsible Futures.
<b>College 3</b>	We have a Sustainability Group, as well as students inputting into the evaluation of the delivery of wider skills such as sustainability awareness.
<b>College 4</b>	This is monitored through our annual Skills Framework completed in a course by course basis. We have had a number of initiatives on sustainability in the college such as staff development days and raising student awareness.
<b>College 5</b>	Skipped.
<b>College 6</b>	Adherence to and implementation of the contents of Carbon Management Plan.
<b>College 7</b>	No clear focus.
<b>College 8</b>	Skipped.

Not a lot of information was gained from this question. Again Colleges 5 and 8 chose to skip it. This response is in keeping with the information previously provided in their earlier responses, since a number of questions were skipped, and them advising ESD had no priority (College 5) and was low priority (College 8). College 7 gave ESD medium priority but acknowledged it was not very widespread and only embedded in a few departments, which correlates with them advising there is no clear focus in place to develop ESD in the curriculum. The remaining colleges provided information that may be able to be checked against the processes they have in place within the college in relation to sustainability documentation and guidance the guidance they have produced themselves. Any such in-house sustainability documentation that exists within individual colleges will be examined later in this chapter. In terms of the response received from College 6, that ESD will be developed in the curriculum by ‘adherence to and implementation of the contents of their Carbon Management Plan (CMP)’, it will be interesting to observe if their CMP makes reference to the curriculum or not, because in my experience not many Scottish college CMPs do and in the light of the present analysis this is a glaring omission.

‘Higher education is an important site for the development of skills and knowledge to inform graduates’ future professional practice’ (Holdsworth & Thomas, 2015, p1). However, in order to develop these skills and knowledge the educational institution must first have developed the approaches to do so. Moreover ‘this requires educators to recognise that, if the take up of learning and teaching is to develop the required graduate capabilities, educators need to recognise that curriculum and learning and teaching methods are a subset of their pedagogy’ (Holdsworth & Thomas, 2015, p5). Over twenty years ago Robottom and Hart (1993) stated that ‘a lack of reflection on one’s practice will fail to transform practice into praxis, reinforcing the current reductionist, individual approach to education seen today’ (Robottom & Hart 1993, cited in Holdsworth & Thomas, 2015, p5). In the context of ESD, it is especially crucial that colleges as ‘educators’ are provided with the opportunities to reflect critically upon current practice to enable future curriculum development. Furthermore, this must also translate meaningfully to lecturers’ pedagogy in relation to learning for sustainability, because pedagogy is the educator’s vision of education and society (Fien & Tilbury, 2002). Pedagogy shapes educational practice and ‘the development of a theory of practice leading to quality education challenges the educator to consider it as more than the development and design of learning activities’ (Holdsworth & Thomas, 2015, p7). Critical reflective practice which interrogates pedagogy is of course vital to effective learning and teaching. However, as this chapter has demonstrated the tendency towards the individualisation of responsibility

which often comes with the doctrines of reflective practice cannot be used to exonerate institutions and their leaders from responsibility for the inadequacies in current institutional leadership and strategic planning. These are corporate obligations and need to be foregrounded in the core identity, mission and reputation of the colleges themselves.

The need for educators to reflect on learning for sustainability pedagogy along with the need to reorient the curriculum to include sustainability are added pressures that will also, ‘no doubt impact upon staff choosing to bid for funding, undertake and submit for review ESD-related research projects’ (Bessant *et al.*, 2015, p424). This puts an academic price on ESD ‘which ultimately brings into question what value and esteem ESD research is currently afforded in our research system’ (Bessant *et al.*, 2015, p424)? Although research is crucial to ‘understand the successes and challenges of the role of educating for a sustainable future, and to drive sustainability activity in institutions’ (Bessant *et al.*, 2015, p426), the progression of learning for sustainability should not be delayed by waiting for research. If further research is required before ESD can progress, then the Scottish college sector may have even more work to do than this survey suggests.

Genuine progression may be achieved by successfully implementing the overall goal of the United Nations Global Action Plan (GAP) which is ‘to generate and scale-up action in all levels and areas of education and learning in order to accelerate progress towards sustainable development’ (UNESCO, 2013, p1). The objectives of the GAP are:

- Reorienting education and learning so that everyone has the opportunity to acquire the values, skills, and knowledge that empower them to contribute to sustainable development.
- To strengthen education and learning in all agendas, programs, and activities that promote sustainable development (UNESCO, 2013, p1).

The GAP has five priority action areas which ‘are considered key leverage points to advance the ESD agenda which are:

- (a) Policy support,
- (b) Whole institutional approaches,
- (c) Educators,
- (d) Youth, and
- (e) Local communities (UNESCO, 2013, p1–2).

Achieving the objectives of the GAP in these five priority areas would aid effective curriculum development for learning for sustainability indeed, they could prove vital to radical systems change if they were mobilised on behalf of strategic planning.

**7. What do you know about the United Nations Decade of Education for Sustainable Development (UNDESD) and how have you responded to it within your institution?**

*Table 4.10 - Awareness of the UNDESD*

College	Processes
College 1	I don't know about it, but will now research this
College 2	We are aware of the UNDESD and the Sustainable Development Adviser monitors this and advises the college accordingly
College 3	Not aware of it
College 4	A limited amount
College 5	Skipped
College 6	Not aware of it
College 7	Nil
College 8	Skipped

College 2 actively employs a Sustainable Development Adviser, which may explain why the UNDESD is monitored and acted upon here, unlike the other colleges. Without this role, I am certain the response from College 2 would have been similar to other colleges.

The General Assembly of the United Nations (UN) stated 'we resolve to improve the capacity of our education systems to prepare people to pursue sustainable development, including through enhanced teacher training, the development of sustainability curricula and the development of training programmes that prepare students for careers in fields related to sustainability' (United Nations, 2012, p44). If the UN measurement of this aim were to come from direct performance assessment of the educational institutions, then

from the limited evidence offered by this survey, they would appear to have been unsuccessful in the Scottish FE sector. However, the UN customarily measures the success of these goals by the self-reporting of individual national governments. If this is the case in the present context, then the Scottish Executive and Scottish Government both responded effectively by producing guidance for all levels of education – *Learning for our Future* (2006) and *Learning for Change* (2010) – even if this guidance did not always translate into positive change in colleges. It seems very obvious that national policy documents should be a stimulus for critical drill-down into the detail of actual educational practice. This could be both a reproach to existing shortcomings and an invitation to more ambitious attainment.

In relation to the crucially important UNDESD, teacher education for sustainable development has been introduced in Scotland - first through the GTCS Professional Standards, and also by the Professional Standards for Lecturers in Scotland's Colleges. These advances in the training of teachers and lecturers overseen by Government, were undoubtedly developed in response to the UNDESD and it is evident that the Scottish Government has been influenced by the UNDESD across a range of its policies. It remains to be determined if this commitment has been translated into effective college policy, or into daily college practices that relate directly to the UNDESD. However, I do know from my own personal professional experience, and from discussions with numerous staff members from various colleges, that they are *not* aware of the UNDESD and it has not impacted their own practice.

A further aim of the United Nations was 'to resolve to promote education for sustainable development and to integrate sustainable development more actively into education beyond the Decade of Education for Sustainable Development' (United Nations, 2012, p45). Considering it does not appear to have directly influenced Scottish college education during the decade, it will be interesting to see how the UN plans to do this beyond the decade. Furthermore, the UN 'strongly encourage educational institutions to consider adopting good practices in sustainability management on their campuses and in their communities, with the active participation of, *inter alia*, students, teachers and local partners, and teaching sustainable development as an integrated component across disciplines' (United Nations, 2012, p45). Again this will depend on the Scottish Government's response and translation into educational policy. However, it is important to note that practical sustainability management on campuses is being publicly scrutinised and the policy formalised through e.g., the introduction of compulsory carbon reporting for

all public bodies classed as climate change actors. Most colleges will fall under this category from 2016. In addition, most colleges and universities in Scotland are currently undergoing a pilot year of collecting data for reporting (2015), supported by Keep Scotland Beautiful, Resource Efficient Scotland and the Sustainable Scotland Network, with the first deadline for submission being 31 November 2015. This seems further to confirm the centrality of directive and legislative policy making and enforcement in producing desired outcomes in this area. The impact of external mandates on college environmental performance strongly suggests that more ambitious and externally moderated demands might fruitfully be made of the institutions in relation to curriculum, pedagogy and assessment.

Even where an individual college is aware of the UNDES, Wals (2014) points out that it would be ‘difficult to discern which processes and learning activities were developed specifically for the DESD and which have gained or gathered momentum because of the existence of the DESD’ (p9). Hence, even if it were possible to easily capture changes in FE relating to sustainability in recent years, it would still be problematic to determine what changes, if any, were directly attributable to the DESD. Where senior management seemed to be unaware of the DESD, positive sustainability work may still have been influenced by the DESD nationally through Government interventions and locally by ‘sustainability champions’ where they have the power to influence curriculum change below the radar of managerial policy making and monitoring. It is therefore reasonable to conclude, that even though most of the colleges that responded to the survey appeared to be unaware at executive level of the UNDES, it still had a positive impact on education in Scotland precisely because the Government chose to implement the aims of the Decade and provide guidance on how to achieve them through multiple channels that would reach many frontline practitioners.

### **College’s Sustainability Policies and Practice - Executive Documents**

Where information could be obtained progress appears to be patchy with the restructure impacting the level of importance afforded to ESD in some colleges. Progress within many colleges does not appear to match policy importance placed upon ESD and its progression within education by the Scottish Government.

Before finishing this chapter, it is important to consider the strategic and managerial dimensions of college ESD policy. Therefore, it is constructive to look at some of the



documents available for public inspection in which these policies are internalised.

Perhaps, in light of the emerging picture, it is not surprising that this material is scarce and contracts still further when correlated with the colleges that responded to the survey.

However, it does reveal another important facet of executive ESD decision making.

I will now focus on what policy and guidance is available – if any – that has been developed in-house in the colleges that responded to the survey, to ascertain if ESD practice mirrors ESD policy. This will be determined by scrutinising transparent environmental and sustainability documentation to establish, firstly if ESD is even included and if it is to verify if practice in the curriculum matches the policy document.

**8. Have you developed any of the following policy documents in your institution to address ESD?**

*Table 4.11 - Individual ESD Policy Documents*

<b>Answer Choices – Total Responses: 8</b>	<b>Responses</b>	
<b>Sustainability Policy</b>	<b>4</b>	<b>50.00%</b>
<b>Environmental Policy</b>	<b>2</b>	<b>25.00%</b>
<b>Fair Trade Policy</b>	<b>0</b>	<b>0%</b>
<b>Carbon Management Plan</b>	<b>6</b>	<b>75.00%</b>
<b>None of the above</b>	<b>0</b>	<b>0%</b>
<b>Other</b>	<b>2</b>	<b>25.00%</b>

**Table 4.12 - Overall ESD Policy Documents**

<b>College</b>	<b>Sustainability Policy</b>	<b>Carbon Management Plan</b>	<b>Environmental Policy</b>	<b>Other</b>
<b>College 1</b>				Department Newsletter
<b>College 2</b>	√	√	√	
<b>College 3</b>	√	√	√	
<b>College 4</b>		√		Student Engagement Strategy and Learning and Teaching Strategy
<b>College 5</b>		√		
<b>College 6</b>		√		
<b>College 7</b>	√			
<b>College 8</b>	√	√		

College 2 and College 7 are both case study colleges and will be evaluated in Chapter Six as part of the overall case studies.

From the responses received, the most produced sustainability document in colleges is a Carbon Management Plan (CMP), with 75% of colleges advising they have one. However, there is no mandatory requirement for a CMP to consider ESD or the curriculum, so it will be interesting to note whether or not they do in these instances. The next most produced documents are a Sustainability Policy, with 50% of respondents advising they have one, followed by an Environmental Policy which 25% of colleges have. Only one college claimed to have any other type of sustainability documentation, however three colleges provided details of other documentation. The answers provided in the survey, however, are not necessarily correct. This was established by looking at the college's websites to see what documentation could be found.

College 1 advised they only had a Departmental Newsletter in relation to ESD. Searching their website also does not reveal any further sustainability or environmental policies.

Their self-evaluation progress against their regional agreement outcomes advises they have a revised carbon reduction target under their Sustainable Institutions Outcome. This Outcome only mentions sustainability against financial stability and carbon management. This college recently (within the last year) employed a new member responsible for their carbon management. During a personal conversation where they asked me for advice in developing their CMP, I advised them not to overlook the wider campus and curriculum within it, and to use it as tool to aid learning for sustainability at a deeper level within their college. Whether they take my advice, or not, remains to be seen. This college has used the learning and teaching materials that I have developed – and that will be evaluated in Chapter 5. However, the materials have been used in isolation by one lecturer, who the survey was passed to for completion. I believe the survey was passed to this particular lecturer because she has attended EAUC sustainability learning and teaching events.

College 3 according to the survey results, has more environmental or sustainability policy documents than the other respondents. However, these policies are not available as public documents on their website. Their College Strategic Plan, which is readily available, refers to the environment and sustainability throughout including the curriculum and staff development. From the contact I have had with this college, I know sustainability is considered a high priority, which was confirmed by the response to the survey (Table 4.5). They also advised ESD is very widespread in most departments (Table 4.7). Although, I have been unable to determine what is advised about ESD in their other policy documents, from personal contact, and awareness of the work they are conducting, which has been recognised by many external awards, I believe this college to be sector leading, not only in Scotland, but across the UK, for their sustainability ethos. Again, I need to stress the importance of ‘sustainability champions’ and effective leadership for successful ESD because in this college these two vital agents for ESD are combined. Their sustainability champion holds a very senior position in the college and also engages with other external sustainability stakeholders to a high degree.

College 4 has a range of environmental and sustainability policies, all of which are transparent on their website. There are more policies incorporating sustainability than the survey indicated. The Environmental Information Regulations Policy refers to emissions, waste and carbon. This document is not designed to make reference to the curriculum. Their Procurement Policy and Strategy also mentions sustainability in relation to financial and environmental sustainability in all procurement throughout the supply chain. It also advises the college is moving towards including sustainability in all its activities by taking

a life cycle approach to all procurement. There is no mention of the curriculum or wider campus. However, the life cycle of products students use could be utilised as an ESD learning and teaching tool, making sustainability relevant to student's future employment. Whilst their CMP does focus on emissions reduction and campus management, and does not mention the curriculum, their Curriculum Strategy has sustainability clearly evident. One of its main aims is to develop a sustainable curriculum which will help to create sustained social, economic and cultural growth through skills development, knowledge growth and utilisation. Their Student Engagement Strategy and Learning, Teaching and Assessment Strategy do not mention sustainability, the environment is mentioned but only in relation to the learning environment and not the wider environment. However, the survey response also advised the college has held a number of initiatives on sustainability, including staff development days and raising student awareness. This college is also one of the survey respondents who had chosen to use the learning for sustainability learning and teaching materials I have developed – which are evaluated in Chapter 5 – without being a case study college (where I had discussed with them the use of the materials). As will be discussed later in the thesis, this is an example of positive progression of learning for sustainability through a combined approach of utilising appropriate ESD materials with management buy-in, which is evident from the strategic documents that have been developed.

College 5 advised it has a CMP but it is not available on their website. In their Regional Outcome Agreement document, it states the college aims to be environmentally sustainable, however this is in line with the Scottish Funding Council's 5 Priority Outcomes. The college website advises that their Environmental Policy and Sustainability Policy are being developed and will be made available on their website once adopted. This college advised in the survey that ESD was considered as 'no priority' (Table 4.5). When asked about what policy documents the college would refer to for ESD guidance, the response was the Scottish Executive's *Learning for Change*, (Table 4.3), which was found to be 'not effective at all' (Table 4.4). However, this college also advised that ESD is very widespread in most departments (Table 4.7), even though ESD in the curriculum had not been audited to establish this (Table 4.6).

College 6 advised it has a CMP but it is not available on their website. The college website does not offer any evidence of any further policies or strategies that include ESD or sustainability in the curriculum, however the website does mention sustainability in terms of their climate commitment, reducing carbon dioxide emissions and being a

member of the EAUC. Although this college has audited ESD practice across the curriculum (Table 4.6) which is positive, the survey also revealed that ESD is not very widespread and is only embedded in a few departments (Table 4.7).

College 8 advised it has a Sustainability Policy and a CMP, neither of which were available on their website. The only mention of sustainability on the college website refers to sustainable procurement. There is no transparent information regarding sustainability or the environment in the curriculum on the website. The survey response advised that ESD was 'low priority' (Table 4.5), and that no resources were referred to for ESD guidance (Table 4.3). Of all the colleges that responded to the survey, this college provided the least amount of information and failed to leave an answer to most questions.

## **Conclusion**

Even from the limited survey data that is available, a pattern is beginning to emerge from the colleges which comprehensively completed the survey and provided more substantial amounts of information, in comparison to those respondents who failed to answer most of the questions. It is becoming apparent, those colleges with the most to report on ESD, would appear to give it a higher priority, which is also corroborated by the strategic executive documentation which is available on their websites.

The next chapter will look to build upon the bigger picture of sustainability across the colleges that responded, to gauge the opinions at a senior level, of the learning and teaching materials I have developed to aid the progression of learning for sustainability within the curriculum in Scotland's Colleges.

## **Chapter Five: Education for Sustainable Development Learning and Teaching Materials**

### **Chapter Purposes**

- To present the survey findings at a college level regarding the use of the learning and teaching materials developed by myself and analysed as part of the research project.
- To critically evaluate senior management opinions of the learning and teaching materials and situate these opinions within my observations of education for sustainable development (ESD) in the Scottish College sector.
- To begin to determine to what extent, if any, I have influenced the progression of ESD in the Scottish College sector.
- To discuss the above points pertaining to my own sustainability ethos and ethnographic findings during the research period.

### **Introduction**

The previous chapter focused on senior management opinions of ESD and the progression of learning for sustainability in the Scottish College sector throughout the research period. This chapter aims to present the survey findings of views of the learning and teaching materials that I have developed and that are available for all of Scotland's Colleges to utilise. I will also begin to establish if my own sustainability work and ethos has translated into positive change within the sector, first owing to the learning and teaching materials I have developed and secondly, through other sustainability work with which I have been involved within the sector. The underlying purpose throughout this chapter is to determine to what extent I have been able to influence the progression of ESD within Scotland's Colleges.

As a researcher I am well aware that the focus upon, and evaluation of, my own resources complicates my own researcher subjectivity and my positionality within the data collection, however, I believe keenly that the research instruments applied to these materials preserve genuine objectivity through the dominant perspectives of end users and co-constructors of the learning. These factors mitigate bias and support a properly triangulated conception of the activities and materials in action.

## Education for Sustainable Development Learning and Teaching Materials

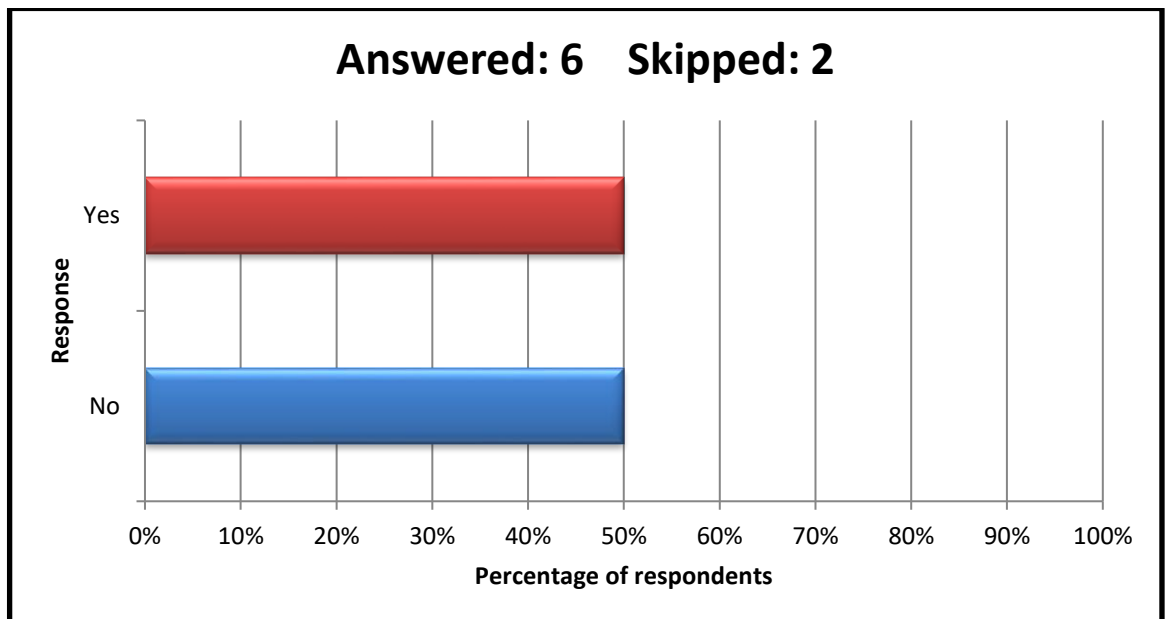
The survey results regarding the use of the ESD learning and teaching materials I have developed follows, along with a discussion of the results situated within the landscape of Scottish College education. My own sustainability ethos, during the research period, will also be evident in this chapter. The questions in the survey concerning my ESD materials all relate to the use of the first Workbook developed in the series entitled an *Introduction to Sustainability: The Carbon Challenge (Education for Sustainable Development) Workbook* (Appendix IV). I decided to concentrate on the *Introduction to Sustainability Workbook* (Appendix IV) for the survey because this was the first workbook to be made freely available, and it was sent to all colleges by Colleges Scotland. Also, it can be used as a generic resource for staff and students in any curriculum area. However, when the survey was issued, the *Introduction to Sustainability Workbook* was attached to the survey, along with the *Hairdressing Heroes: Fighting the Carbon Battle (Education for Sustainable Development) Workbook*, which is a curriculum specific workbook for Hairdressing students (Appendix V). There are also other curriculum specific workbooks available which I have developed, for Construction, Beauty and Complimentary Therapies and Health and Social Studies staff and students, all of which are freely available for use in Scotland's Colleges. The full range of workbooks is available on the Environmental Association for Universities and Colleges (EAUC) website at;

[http://www.sustainabilityexchange.ac.uk/college\\_education\\_in\\_sustainable\\_development\\_es](http://www.sustainabilityexchange.ac.uk/college_education_in_sustainable_development_es)

The questions asked and discussion provided in this chapter relate to *senior management views* of the workbook materials as opposed to perspectives of those who have used the materials. In the next chapter curriculum specific resources used by Hairdressing, Beauty and Care students are analysed in greater detail as case studies. The feedback received from staff and students, as users of the materials, will then be compared against the overall progress of learning for sustainability across the sector.

## Part Two: Strategic Level Opinions of the Learning and Teaching Materials

### 1. Have you used the *Introduction to Sustainability Workbook* in the college?



**Figure 5.1 - Use of the Workbook**

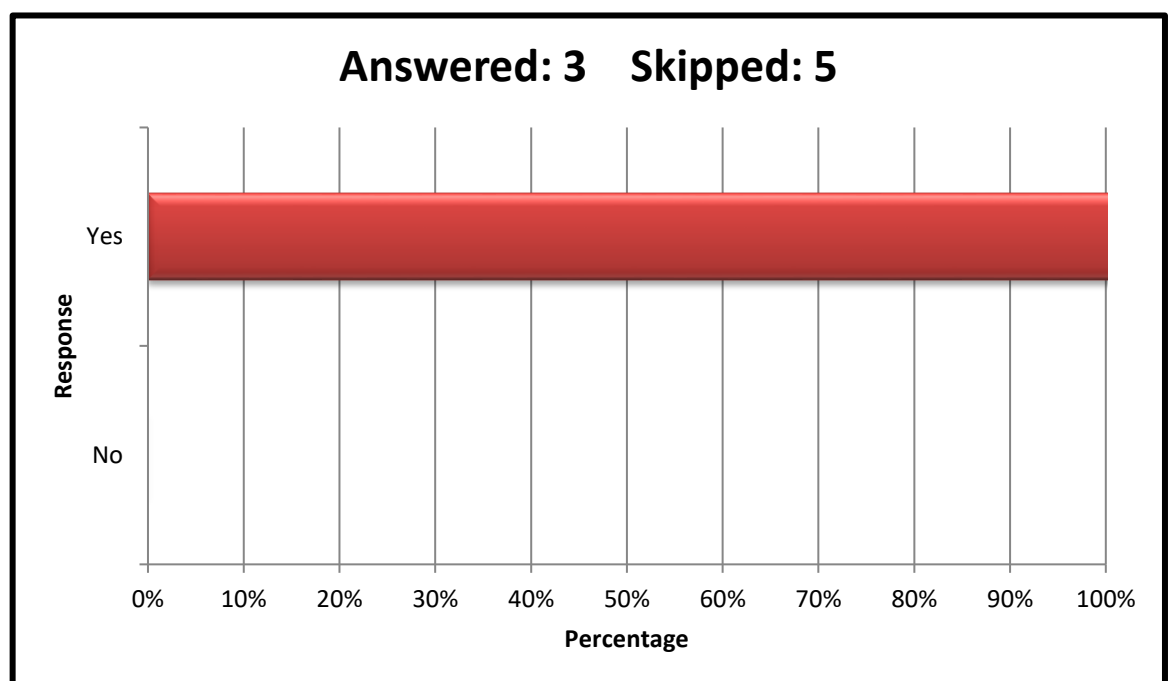
Of the eight survey respondents, only three answered positively that they had used the *Introduction to Sustainability Workbook* (hereafter referred to as the *Workbook*). One respondent advised their college had not used the *Workbook*, and also later advised they were unaware of any of the sustainability learning and teaching materials available that I have developed, however their college was one of the case study colleges. The college in question has extensively used the *Hairdressing Heroes Workbook*, and not the *Workbook* to which the survey refers. However, another staff member at the same college had advised me previously they would adapt the *Introduction to Sustainability Workbook* for use as a core skills resource combining learning for sustainability with numeracy, literacy and IT skills. Therefore, taking into account the college that answered incorrectly, four of the eight colleges that responded to the survey have actually used the *Workbook*. This survey question also requested further information to provide details on *how* the *Workbook* had been used in the college. All comments received are provided in Table 5.1.



**Table 5.1 - Comments received about the use of the Workbook**

<b>Comments Received in Response to Question 1</b>	
	‘We used some of the details in the workbook toward access to level 5 students producing their assignments’.
	‘This workbook has been used for staff development and adapted for use with care students. It has also been used with access to Higher Education students for extra credit. Other curriculum specific workbooks for Hairdressing and Construction students have also been used’.
	‘Three to four staff teaching sustainable courses in Science and Environment have used the workbook’.
	‘I am not aware of having received this workbook but will now check with our front office team and other colleagues to check its whereabouts’.

2. If you have not used the *Introduction to Sustainability Workbook* yet, do you intend to use it in the future?

**Figure 5.2 - Future use of the Workbook**

Of the three colleges that answered they would use the *Workbook* in the future, one respondent was a college that had already used the *Workbook*. Also, five colleges chose not to answer this question and skipped it; however, one respondent was the college that answered the previous question incorrectly. Taking into account the discrepancy in the answer to Question 1 in this Chapter, means that of the eight survey respondents, six in total had either used the *Workbook* or indicated they intend to use it in the future. No respondent advised they would be unwilling to use the *Workbook* in the future. There were two colleges where the *Workbook* had not been used, and which also did not respond to this question, one being the college which advised earlier in the survey that ESD was of ‘no priority’ in their college (Table 4.5).

Three of the eight respondents advised they had used the *Workbook* (Figure 5.1). However as previously signalled, one college responded incorrectly that they had not used the *Workbook*, when in fact it had been used in the college and the respondent was unaware of this. Worryingly in this instance the respondent was the Vice Principal of Curriculum. As evidenced in the previous chapter, there is some indication that the knowledge of ESD and its drivers within an institution may be variable at the senior management level. This may be attributable, as suggested, to the absence of a universal model either globally or nationally, of ESD and its full implementation (Hopkinson *et al.*, 2008).

This however, is just one concern, and not one that is limited to Scottish further education (FE). I have previously discussed Dawe *et al.* (2005), who highlighted various barriers to embedding ESD in higher education (HE), including limited staff expertise and limited institutional drive. Furthermore, as Hopkinson *et al.*, (2008) stated, ‘sustainable development activity in HE institutions is still a patchy phenomenon that tends to be led by individual enthusiasts rather than being integrated into HEI systems and processes’ (p438). Hoover and Harder (2015) have also highlighted that oftentimes sustainability work by individual enthusiasts is additional to their normal duties and can go largely unrecognised or unrewarded. The issue that ‘very few HE institutions have integrated sustainable development across the institution’ (Hopkinson *et al.*, 2008, p438) is one that I have also evidenced from my own experience as an ESD practitioner in the Scottish College sector. It is likely that this cluster of problems could be more fully resolved by formalising ESD leadership, recognising and rewarding sustainability champions and, offering incentives for them to continue and enlarge their work (AASHE, 2010).

The *Introduction to Sustainable Development Workbook* resource was made freely available to all Scottish College campuses by Scotland's Colleges (now Colleges Scotland). It was emailed directly to all college Principals months prior to this survey. It was also sent to all college Principals again by the EAUC, along with the survey, advising the range of Workbooks available, as part of the Scottish Funding Council (SFC) funded and endorsed *ESD in the Scottish College Sector Project*. Taking into account the endorsement of the *Workbook* materials by Scotland's Colleges, the EAUC and the SFC, why would only 50% of respondents (four of the eight colleges who replied to the survey) have used it and also why was the survey response rate so low? If colleges were committed to embedding ESD throughout their institution and curriculum it could surely safely be assumed that they would willingly receive and utilise any free resources, provided they believed they were fit for purpose. This is especially salient if Scottish education is to address the fatalistic and widespread view that 'in spite of our efforts, contemporary societies seem ill-equipped to cope with the enormous social and environmental issues of our age' (Houser, 2012, p192). If society is ill-equipped to meet these enormous challenges, then it seems clear from the international evidence that education can be one of the keys to addressing this deficiency. Indeed, education understood as just such a key is evident in milestone Scottish Government educational guidance documents *Learning for our Future* (2006) and *Learning for Change* (2010).

However, 'the problem is not merely with the broader population [since] academics too have been unable or unwilling to assess the challenges we face' (Houser, 2012, p192). This inability or unwillingness may be a deeper explanation for any perceived 'irrelevance' of the materials, for their seemingly low uptake, or indeed the lack of response to the survey. However, as confirmed in Figures 5.1 and 5.2, 75% of respondents advised they had either used the *Workbook* or would be willing to do so in the future. This is much more promising but it also poses the questions – was the *Workbook* not used by all of the colleges that responded because:

- 1) The respondent was unaware of the existence of the *Workbook*? Or because,
- 2) The respondent was unaware that the *Workbook* had been used?

The answer to these questions could lie in the timing of the survey. It could either be because the original *Workbook* correspondence was sent to one Principal and by the time the survey was issued there was a different Principal in place as a result of the college

mergers. Or alternatively the survey respondent was not the college Principal and they were therefore unaware of the original *Workbook* correspondence.

I believe the answer to these questions, more likely, lies in the timing of the research period. The upheaval in the Scottish College sector, which needs to be stressed again, coincided with the period when the *Workbook* materials were made available. The *Workbook* was sent to college Principals, many of whom were acting Principals, only in place until the college mergers were completed. It may be that *acting* Principals would be less likely to implement curriculum changes, especially if they knew they would be leaving the service of that college shortly afterwards. With concerns about job security, particularly at senior management levels, ESD – or any other curriculum development – may not have been viewed as important owing to other considerations. If changes in the sector are not the main reason for a low uptake of the *Workbook*, or limited response to the survey, this needs to be investigated further because it is crucial for ESD progression that the question of apparent apathy is answered.

This tension needs to be resolved because as Dewey (1966) famously observed ‘any education given by a group tends to socialize its members, but the quality and value of the socialization depends upon the habits and aims of the group’ (p83). Therefore, the ‘habits and aims’ of college Principals will definitely impact upon the progression of curriculum developments across Scottish college education. Education Scotland (2014) has recognised that for change within schools to be effective, ‘leadership is the key and the commitment and vision of the head teacher is crucial’ (p6). Without management buy-in it is very difficult, if not impossible, to shift pedagogy within a college to a model that focuses comprehensively on sustainability. This is evident again and again in the obvious gap between Scottish Government’s political will to promote learning for sustainability and the reality of ESD learning and teaching in the nation’s educational institutions (Dawe, *et al.*, 2005).

The ‘habits and aims’ of the wider stakeholders and leaders in Scottish education will also inevitably impact upon the education provided in Scotland’s Colleges. The habits and aims, therefore, of interested parties such as Education Scotland, College Development Network, the SFC and the Scottish Qualifications Authority (SQA) are also destined to exercise a major influence upon Scottish College education. For example, Education Scotland evaluates sustainability in college reviews and reports on its findings. During

college reviews, Education Scotland looks to determine the following about sustainability within the college:

- Achievement of core and essential skills including employability, citizenship, sustainability and health and wellbeing. (Element 2 – Impact on Learners and other users of College Services, Quality Indicator 2.3 Learner progress, attainment and wider achievement)
- Arrangements to promote sustainability of resources. (Element 8 – Partnerships & Resources, Quality Indicator 8.2 Management and use of resources and learning environments)
- Responsiveness to national policies and local issues including environmental sustainability. (Element 9 – Education Leadership & Direction, Quality Indicator 9.1 Educational aims, objectives & targets)

Education Scotland recognises sustainability as a core skill, along with employability and citizenship – both of which are embedded within Scotland’s Colleges to a far greater extent than ESD. So could ESD learn from the styles of implementation and progression associated with employability and citizenship? Sustainability is also assessed within resource use, which links sustainability and campus management. Education Scotland now also looks at how the college has responded to national policies and local issues for sustainability, which should nowadays include policies for ESD such as *Learning for our Future* (Scottish Executive, 2006) and *Learning for Change* (Scottish Government, 2010). Given this level and depth of scrutiny, we are surely entitled to ask why the delivery of sustainable learning seems to lag behind, and be so much more piecemeal, than other comparable educational and vocational priorities and initiatives. A number of candidate explanations suggest themselves, even speculatively. For instance, if a school did not respond to Education Scotland’s guidelines there would be a huge outcry, so why is this not the case with sustainability in colleges? If Education Scotland possess tools to assess sustainability in colleges, then why does it appear to have been squeezed out in places? Is it simply because the period of ESD focus in Scottish colleges was during the merger process which hampered progress, and now that the mergers are complete the focus has shifted to something different?

Another critical factor that may be emerging from this work, and related sources of scrutiny, lies in the college culture of change and rebranding itself. Colleges Scotland and College Development Network (CDN) de-merged on 22 January 2015 to introduce

operational changes. The first Strategic Plan produced by CDN after the de-merger from Scotland's Colleges is *Strategic Plan 2015-18 Leading, Creating, Sharing across Learning*. College Development Network's purpose is 'to support and promote the learning community in the college sector to contribute to the social and economic wellbeing of Scotland' (CDN, 2015, p1). College Development Network has six strategic themes and programmes. Strategic Theme Six is:

CDN's Sustainability - We will:

- Demonstrate clear and purposeful strategic direction as an organisation and for the sector.
- Operate best practice in governance and internal management.
- Secure additional funding from a range of sources through high quality delivery.
- Evidence how we deliver a positive impact for the college sector (2015, p6).

It is noteworthy, and indeed potentially ominous, that sustainability is only discussed in the CDN *Strategic Plan* in relation to financial sustainability and learning for sustainability is not explicitly mentioned at all. It may of course be argued that learning for sustainability is implicit within Strategic Theme Two, which focuses on Curriculum, Learning, Teaching and Assessment. The problem with this analysis is one familiar from the enquiry of this thesis: unless the requirements of learning for sustainability are explicit, there is a high possibility that they will be overlooked.

As already highlighted in Chapter One, the SFC also considers sustainability in their *Scottish Funding Council Strategic Plan 2012-15*. The *Plan* acknowledges the contribution of FE and HE to Scotland's future prosperity and sustainability and also mentions the significance of environmental sustainability for resource efficiency and the reduction of carbon emissions in line with Scottish Government policy. However, in the *Scottish Funding Council Strategic Plan 2015-18*, sustainability is only mentioned twice (as opposed to six times in the earlier *Strategic Plan*): first in relation to monitoring sustainability in colleges and universities for resource efficiency, and secondly, for the SFC to develop sustainable business practices and promote sustainability in order to achieve the silver award of the NUS Green Impact Accreditation Framework. Taking this for a moment at face value, there would appear to be a change from sustainability being considered important in education alongside resource efficiency, to sustainability

essentially understood in terms of its importance as a business practice. This belief was echoed during a conversation I had with one college Principal who stated ‘sustainability was no longer a key theme of the SFC and social inclusion was now considered more important’ (Personal conversation, June 2015). The *Scottish Funding Council Strategic Plan 2015-18* focuses heavily on the contribution of education to social and cultural development. Informed insiders will recognise that social inclusion is fully cognate with ESD, only using different terminology. However, worryingly, as my conversation and wider data indicates this recognition does not necessarily extend to the senior management in Scottish Colleges, dealing with rapid processes of educational change and multiple financial and political pressures.

College Principals are more likely to view sustainability favourably if they see it in key documents developed by stakeholder-leaders in Scottish education. However, there is also the endemic risk that attempts to influence the curriculum from the outside by imposing ESD policies may be met with resistance (Knight, 2005). This may explain why some interventions are more successful than others, depending on whether the college views the interventionist as an outsider or not. I believe that stakeholders such as Education Scotland, Colleges Scotland (or College Development Network) and the SFC may be viewed favourably by colleges as influential but *invested* stakeholders, whereas the EAUC may be viewed by some as an outsider. As an outsider, the EAUC may then find it harder to engage successfully with colleges or influence curriculum changes. My judgements on this controversial matter have been formed as a result of attendance at EAUC Topic Support Network meetings for ESD in Scottish FE, of which I am a Network Convenor. Over the last three years, these meetings have never been well attended and it is always staff from the same three or four colleges present. I tried to establish more information regarding this from the survey, (see Table 4.3), however with only eight responses this cannot be definitively confirmed or rebutted. However, Table 4.3 does confirm, from these respondents, that they would be more likely to contact Colleges Scotland or Education Scotland for guidance on ESD. In terms of college engagement with the EAUC, they appear to be in a difficult position. There are reasons why colleges are not engaging with them that need to be explored. In turbulent times they may not have the same traction that other organisations have as colleges may view the EUAC as having less authority, or as a support network rather than a strategic partner. This lack of status in college’s perceptions may go some way towards answering this.

Whatever the effects of these conjectures, it remains clear that the steps that are required to support senior management in ensuring that sustainability literacy has been successfully embedded into FE curricula have yet to be fully determined. The gap between the Scottish Government's political imperative to promote ESD, and the daily reality of ESD learning and teaching in Scottish Colleges also needs to be bridged. With just such ambition, the Higher Education Academy (HEA) launched the Green Academy organisational change programme in 2011 to assist universities in embedding ESD into the overall student experience. An evaluation of the Green Academy at seven English and Welsh universities established that it had positively influenced sustainability being included in its integration into corporate committee structures (McCoshan & Martin, 2014). Owing to this development, sustainability is now highly visible within the corporate documentation of these institutions (McCoshan & Martin, 2014). The Association for the Advancement of Sustainability in Higher Education (AASHE) also believe that sustainability should be included in strategic documents because 'many important efforts on campuses are guided by the language in the institution's mission statement' (AASHE, 2010, p9). It now seems very clear that if their declared objectives are to be attained, senior management in Scotland's Colleges also need to ensure that sustainability is of the highest profile in their strategic documents, because this will provide 'leverage points for future discussions about sustainability curricula and the resources needed to enact it' (AASHE, 2010, p9). Utilising strategic documentation in this fashion is a tactic I have employed myself. I have made ESD and sustainability a central theme – alongside the reduction of greenhouse gas emissions – of the college's Climate Change Action Plan, in the college where I am employed. Therefore, I fully agree that this can be a successful route for learning for sustainability implementation across a college campus and curriculum. However, as a researcher I can observe that I am in a fairly unique professional position, because as far as I know, I am the only employee in any Scottish College who has been employed in the joint roles of carbon management and learning for sustainability in the curriculum. My own positionality here is illuminating, because it may point to the principles of research-led practitioner enquiry as enablers of long term and meaningful progress in the area. My own uniqueness may therefore establish part of the blueprint for more ambitious change.

One possible and perhaps neglected source of usable documentation has already been copiously referenced in this thesis: that is the United Nations (UN), via the support it can generate among progressive national governments: because 'Education for Sustainable Development (ESD) is about shaping a better tomorrow for all – and it must start today' (UNESCO, 2014, p8). The Scottish Government has of course been guided by the UN, but



the emerging picture from the previous chapter is that this prestigious mandate has not been translated effectively into the important aspects of Scottish College education with which this research is chiefly concerned. It therefore seems obvious that, while global intervention from the UN may impact educational policy positively at a national level, it does not automatically close the rhetoric-reality gap and result in progressive curriculum reform around the core values of sustainability.

It remains to be established what measures would be required to ensure that global sustainability initiatives do translate into constructive curriculum change at a national and at a local level. United Nations initiatives such as the Millennium Development Goals and the Sustainable Development Goals undoubtedly have the capacity to influence education in developed nations, but if developed nations do not have the same challenges as developing ones, they surely do not have the same motivation to include education in programmes aimed at reducing poverty or ending hunger. This general observation could be problematic for ESD because ‘as long as policies and strategies are structured and managed by people whose well-being is not under immediate threat, then the urgency to get things sorted out gets back-burner treatment’ (Leal Filho *et al.*, 2015, p121). Understanding and effectively transferring knowledge about concerns that do not directly and immediately affect us requires a paradigm shift from current educational practice. Colleges need to stop being institutions, in other words, which ‘transmit and deliver’ and become organisations for authentic transformation and critical enquiry (Sterling, 2012). In order to achieve this, however, the United Nations needs to have mechanisms to ensure that Organisation for Economic Co-operation and Development (OECD) countries will educate their populations through programmes such as the Sustainable Development Goals. In just this spirit, UNESCO argues the following about global education:

Education deserves to be a prominent cornerstone in the post-2015 development framework. The political and financial commitments to education by countries and donors need to be secured and renewed. There is a pressing need for closer collaboration across sectors to enable these synergies to take shape and take root (2014, p15).

The Global Education First Initiative was launched by the UN Secretary-General in September 2012 and ‘leverages engagement at the highest political level and counts on 16 Champion Countries to lead by example and catalyse political and financial support for education among governments’ (UNESCO, 2014, p15). To be successful, major

international endeavours of this kind need to induce bodies such as the Scottish Government to translate the movement into practical educational policy. It is clear that, in the domain with which this research is preoccupied, unless government directly changes and monitors educational policy there is a danger that Scottish Colleges will continue as Leal Filho *et al.*, (2015) suggest, and confine ESD to the back-burner, on the assumption that the threats with which it is mainly concerned are not in fact immediate.

UNESCO developed a Global Action Programme on Education for Sustainable Development launched at the World Conference on Education for Sustainable Development in November 2014, as a follow up to the UNDESD. The Global Action Programme comes with a detailed implementation roadmap to guide all stakeholders including Governments, the private sector, media and the academic and research community but also for use by all educational institutions and individual teachers and learners. The UN appears to acknowledge that ‘a completely top-down approach to the implementation of sustainable development, as was the traditional approach, is not working as planned’ (Leal Filho *et al.*, 2015, p123). This is further evidenced by the UN declaring that sustainable development,

can only be achieved with a broad alliance of people, governments, civil society and private sector, all working together to secure the future we want for present and future generations (United Nations, 2012, paragraph 13).

However, my findings suggest that staff in Scottish Colleges would be unlikely to refer to UN documentation or guidance and would look to other mediating bodies such as Education Scotland or Colleges Scotland to channel any necessary guidance on sustainable development. This is confirmed from the limited response the survey generated (Table 4.3), where only one college advised that they would routinely refer to UN documentation. This response was from the college where I am employed and where I do underline the importance of UN guidance. This contrasts with five colleges who advised they would refer to Education Scotland and Colleges Scotland as national brokers of this guidance.

Leal Filho *et al.* (2015) analysed documentation from the key ESD conferences and concluded that,

although every sector of society is usually mentioned and specifically targeted, the ESD envisaged for policymakers is indirect and taken for granted [furthermore]

there is the inherent assumption that policymakers receive their ESD either from their formal education years or from training programmes related to their employment (not their policy making role) (p124).

In terms of Scottish Government policy on ESD, and the stakeholders they entrust to implement it, it may be to a certain extent a case of the blind leading the blind. Even if government policy is clear in its intentions, it may be that other vital interested parties do not accord the principles of ESD sufficient priority to assist colleges with the task of embedding ESD.

‘Much of the literature on the role of education in general, and the post-secondary sector in particular, has focused on a vision of transition towards a more sustainable society, embracing – though often *not* explicitly – the discourse of sustainability as change’ (Hoover & Harder, 2015, p175, emphasis mine). This vision *is* undeniably explicit in the Scottish Government’s (2010) *Learning for Change* which affirms the importance of remembering that sustainable development is not exclusively concerned with climate change, and protecting the environment, but: ‘It’s about ensuring our children grow up to be responsible citizens in a fair and equitable society; and it’s about working to ensure the wellbeing of all of Scotland’s people’ (p1). This fits with the Scottish ethos of citizenship education which has been developed within Scottish education over the last decade. Furthermore:

This is a whole of Scotland approach, where every individual should have the opportunity to learn about the benefits that a sustainable way of living and working can bring – for every one of us. Creating a sustainable future for us and for Scotland will require widespread understanding and huge cultural change – and the key to achieving this is education for sustainable development (Scottish Government, 2010, p1).

This makes it clear that ESD should be for everyone and it is also explicit that sustainability goes beyond only the ‘environment’ or the ‘economy’ because ‘society’ is equally important. This message is still as important today where the huge cultural shift is becoming apparent, particularly with economic development and the creation of a new wealth model utilising tools such as the circular economy. From the very start of *Learning for Change*, it could not be any more explicit that education – specifically ESD – is the tool for transition to a more sustainable future.

Within education generally, the transition to sustainability needs to be about more than only the role of learning and teaching. It must incorporate campus operations and community engagement. Sustainability should not just be about *what* is done in each of these areas, but also *how* it is done, inviting a fresh articulation of learning and teaching along with organisational change and leadership strategies (Moore, 2005). Another important consideration in addition to *what* is done and *how* it is done is the *time* required to successfully implement ESD. Using *Curriculum for Excellence (CfE)* – ‘in which the principles of sustainable development are firmly embedded’ (Scottish Government, 2010, p1) – as an example, it is vital everyone recognises that the full effects of any changes attributable to *CfE* will take a considerable period to show through (David Hume Institute, 2012) as ‘one of the greatest problems with education and teaching reform across the UK has been a tendency to expect miraculous transformations over very short time scales’ (David Hume Institute, 2012, p44). If ESD is expected to be the means of transition to a more sustainable, prosperous and just future, it needs sufficient time in FE to embed and develop in order to bring about reform of this dramatically anticipated scale.

Citizenship Education in Scotland has been apparent for well over a decade. The Scottish Executive and the Scottish Consultative Council on the Curriculum (now Learning and Teaching Scotland), first set up a working group in 1999 to focus on education for citizenship. By 2006 Her Majesty’s Inspectorate of Education (HMIe) produced a report on education for citizenship provision in Scotland’s Colleges. HMIe found that ‘examples of the practical applications of skills for citizenship are apparent in every college’ (2006, p11). HMIe also reported that ‘most learners also gain useful citizenship skills which are often developed during planned project work’ (2006, p16). I started employment in Scottish FE in 2007, and remember tension then about *Citizenship Education* and what HMIe would report about it during reviews. This tension is no longer apparent at all during Education Scotland reviews (the latest I have witnessed being February 2016). Such change in the climate of opinion does, however, suggest that time is required to embed any curricular development. Important lessons could be learned by ESD from the progression of education for citizenship in schools, colleges and universities. Houser (2012) goes so far as to suggest that ‘citizenship education be located within a broader context of environmental sustainability’ (p205). There may be considerable scope to energise leaning for sustainability as an inflection of education for citizenship, seeing the two as not only mutually enriching but also foundational to successful learning and teaching and project based capacity building. This is confirmed by my own experience of

harnessing sustainability initiatives in college to an annual Citizenship Week. Projects in the past have included:

- recycling awareness by students building a plastic bottle greenhouse which was donated to a community project,
- lug-a-mug launch which gives a reduction in price for hot drinks if using a college travel mug instead of a throwaway paper cup and plastic lid,
- cooking demonstrations with local, seasonal produce linked to food waste with Zero Waste Scotland,
- energy workshops, and
- showing climate change videos made by media students.

### **Reflective Diary Extracts**

#### **January 2014**

The lack of response to the survey is really disheartening, especially from colleges where I have delivered ESD training for staff and students. I had thought the survey would get a better response if sent from the Environmental Association for Universities and Colleges with an endorsement from the Scottish Funding Council, however maybe I should have sent it myself to college Principals. I know this [lack of response] does not reflect what is happening in a lot of college departments as it is department heads that are asking me to go and talk to their staff and students, and that are inviting me along to staff development days. I am already speculating about the lack of response and believe this might lie in a few reasons,

1. The college is in the process of merging with other colleges.
2. The college has an acting Principal in place for a limited period of time.
3. The college Principal, and other senior managers, know they are being made redundant.
4. The Principal is unaware of ESD development at curriculum level.

Whilst, these reasons are all speculation concerning the return of the survey, I do know that reasons 1-3 is the situation in many colleges at the moment. Reason 4 may or may not be true, but even if the Principal is aware of ESD development, considering what is happening in the sector, it is probably not high on the agenda.

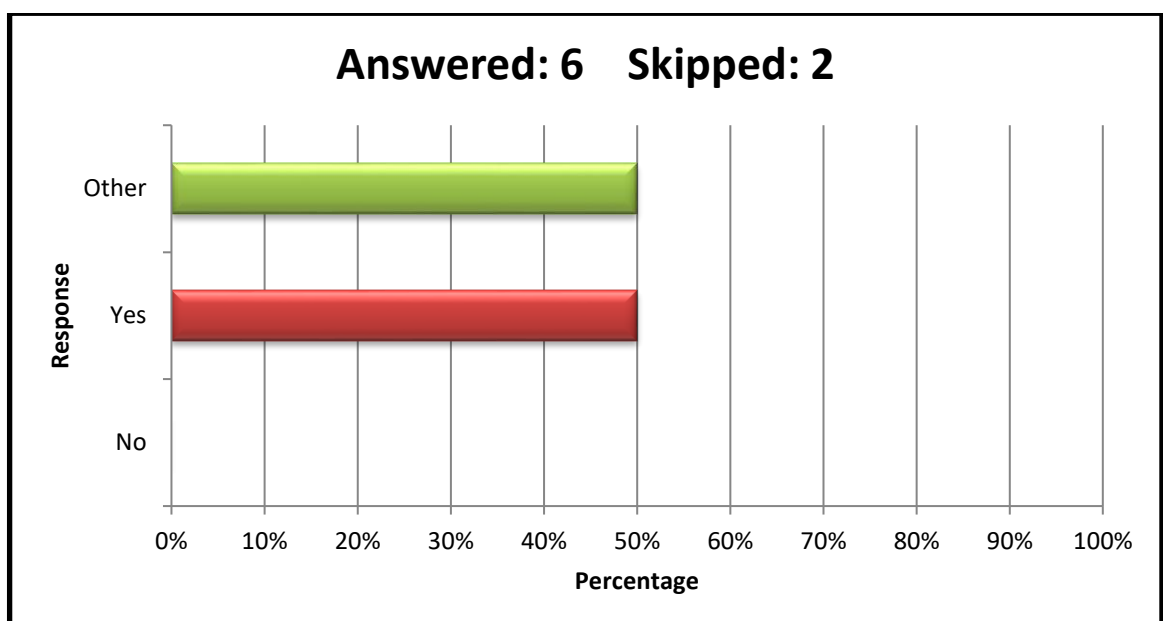
## Reflective Diary Extracts

**March 2014**

I have had another successful ‘citizenship week’ in college, with many events that had an ESD angle linked to Climate Week [2014]. I also attended another college to do a sustainability workshop as part of their Climate Week. Although the survey and a reminder have been sent, responses are not coming back but I know this is not a true reflection of the work being carried out in colleges by dedicated members of staff who are passionate about sustainability and raising awareness of the issues. I am seeing the work with my own eyes in colleges. I know I am in an unusual position because I have access to the colleges to not only observe, but to also participate in their ESD work, but because of this I am really frustrated that I cannot reflect this with the survey findings. I believe that although the sector is in turmoil, those at the coalface, the ESD pioneers in these institutions will carry on regardless. However, another concern I have is that these may be staff lost to the sector due to restructuring.

It may well be that one promising avenue for extending learning for sustainability may have already been opened by the widespread and now uncontroversial ownership of Citizenship Education across national education.

### 3. Did you find the *Introduction to Sustainability Workbook* useful?



**Figure 5.3 - Usefulness of the Workbook**

All of the colleges that advised they had used the *Introduction to Sustainability Workbook* replied positively that they had found it useful. Although the number of respondents was low, and the number who had used the *Workbook* was even lower, it is still encouraging to note that all of the responses received in the survey about the sustainability learning and teaching materials I have produced were positive. No college advised they had found the *Workbook* not to be useful. The survey also invited respondents to leave further comments about their opinion of the usefulness of the *Workbook*. Only one respondent who had knowingly used the *Introduction to Sustainability Workbook* provided a further comment, however two other colleges also provided comments about the *Workbook*. All comments received are provided in Table 5.2.

**Table 5.2 - Comments about the Introduction to Sustainability Workbook**

Comments Received in Response to Question 3
‘Good sources of worked examples for sustainable issues’.
‘Not aware of having received this workbook but will now check with our front office team and other colleagues to check its whereabouts’.
‘No knowledge of this workbook’

The first college had used the *Workbook* with students, utilising the activities in the *Workbook*. Each of the other colleges advised they had not received the *Workbook*, or were not aware of the *Workbook*. However, the third college that advised they had ‘no knowledge of this workbook’ was one of the case study colleges and I know they have used the materials in this college.

#### 4. What did you think were the main strengths and weaknesses of the *Introduction to Sustainability Workbook*?

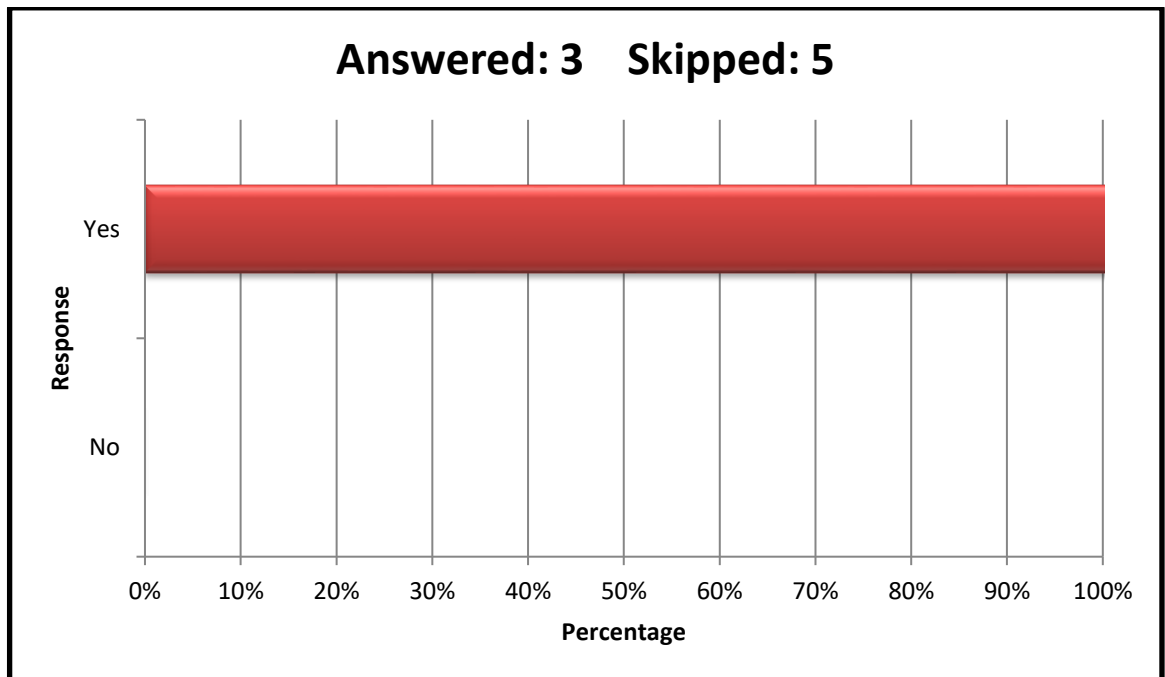
Respondents were asked to provide written information on what they believed were the strengths and the weaknesses of the *Introduction to Sustainability Workbook*. All comments received are provided in Table 5.3.

**Table 5.3 - Comments about the strengths and weaknesses of the Workbook**

Strengths / Weaknesses	Comments
Strengths	'Great ideas to help starting learners understanding sustainability'.
	'Contextualised for the curriculum'.
	'Some of the calculations and worked examples were pertinent'.
Weaknesses	'Does not relate directly to the beauty curriculum'.
	'Finding time to use it in the curriculum'.



**5. Have you introduced or do you intend to introduce any of the activities in the *Introduction to Sustainability Workbook*?**



***Figure 5.4 - Activities used from the Workbook***

The three colleges that responded all answered positively that they had used some of the activities from the *Introduction to Sustainability Workbook*. One college also advised they would be passing it to their Hairdressing department and hopefully they would use it also (Table 5.4), this college had used the Hairdressing Workbook with Beauty students. Of the five colleges that skipped this question, one college had in fact used the *Workbook* and the activities within it as a case study college. However, the senior member of staff who completed the survey was unaware of it. Of the further four colleges that skipped this question, one college had advised ESD as ‘low priority’ within their college and one college advised ESD was of ‘no priority’. The other two colleges that skipped the question advised they intended to use the *Workbook* in the future.

**Table 5.4 - Comments about the activities used from the Workbook**

<b>Comments Received in Response to Question 5</b>
‘I have passed this onto the Hairdressing department and hopefully they will use it’.
‘Some of the worked examples of calculations of energy consumption’.

**Reflective Diary Extracts****4 February 2013**

A really upbeat day today at Scotland’s Colleges at the Sustainable Development Education Steering Group. Four different colleges have advised they will be in touch with me to deliver staff development sessions. I also received really positive feedback about the workbook materials and the activities that could be used in different curriculum areas, after I did an initial introduction to sustainability lecture. It is interesting that there is more interest now from other curriculum areas and not just hairdressing. Although I was using the Hairdressing Heroes Workbook staff could see how the activities could be used in other curriculum areas. One college is also very interested in using the activities for core skills learning and teaching, so sustainability related exercises which include calculations or using ICT skills for producing posters and group PowerPoint presentations etc.

**May 2013**

This has been a really busy month with lots of interesting developments. I attended my first Topic Support Network for ESD in FE as a joint convenor with my colleague on the SFC funded ESD in Scottish FE project. The workbook materials were circulated and this has generated visits with three new colleges. I’ve had discussions to develop new materials for College Development Network on hospitality and sustainability. I’ve also had meetings with the Eco-Schools Secondary Development Officer to discuss using the materials in schools and a brief discussion with a representative for the Open University who may also be interested in the materials and activities.

As the diary extracts demonstrate, there was interest in the workbooks materials from a number of different sources. I can also confirm from meetings with colleges, largely as part of staff development sessions which have taken place in particular colleges more than once, that the materials I developed were used to a far greater extent than is reflected in the survey results. However, I stand by the decision to issue the survey to college Principals, and not my known contacts, as the survey aimed to establish senior management's knowledge of ESD in their institution. I believe a pattern is beginning to emerge that demonstrates the lack of strategic management within colleges to formalise ESD progression within the curriculum. I know at curriculum level, in many colleges, there is clear-cut, categorical evidence that can be demonstrated that ESD is being embedded, so why is the leadership so disconnected? Maybe the leadership is not disconnected, maybe they just did not have the time or inclination to complete the survey. I do feel that although I have seen many instances of ESD activity, it still has not taken root and permeated FE culture in the same way as citizenship education or equality and diversity have. This could be because ESD has not been endorsed to the same extent by Education Scotland as citizenship education and equality and diversity were previously. It also needs to be acknowledged that FE does not have the research culture or scientific expertise that HE does, therefore there is no pressure for practice to reflect research findings. This explains why HE may appear to more advanced in ESD development.

In producing the learning and teaching materials as part of this research I am unreservedly intending to bring about change. Before such change is engendered, we of course need to establish why change is required in the first place. The thesis has already established why change is critical because of the environmental problems, including climate change, already discussed in earlier chapters.

Climate change literature is increasingly discussing adaptation 'using the language of transformation, reflecting a sense that the current status quo will not secure a sustainable future' (Lonsdale *et al.*, 2015, p6). This 'transformation' intimates a 'fundamental change within and across systems, emphasising the current adaptation deficit and seeking to move away from a perception that 'incremental is enough'' (Lonsdale *et al.*, 2015, p6).

Incremental gradualism is not enough, and there is a need to translate this requirement for 'big change' to staff and students – in a manner which is not patronising, but which also clearly emphasises the importance of the message that has to be conveyed. If climate change education for mitigation and behaviour change is unsuccessful in the short term, it may be inevitable that alternatives are considered. For example, 'current approaches to

climate change adaptation represent a new form of environmental determinism, in that many now consider it easier to accept future temperature increases of up to 4°C or more within this century (along with other environmental and social changes) than to pursue transformative strategies to avoid such changes' (O'Brien, 2012, p668).

As explained earlier in this thesis a number of different approaches to incorporate sustainable development into higher education institutions have been utilized, with varying degrees of success (Lozano *et al.*, 2013b). However, whatever approach is adopted to bring about organisational change, how to successfully achieve such change needs to be, in the view of many commentators, 'better understood' (Verhulst & Lambrechts, 2015, p189). Regardless of approach, the ultimate goal is to equip the students so they can contribute to a sustainable society, and as Stevenson (2006) advises:

Educators do not need a vision to adopt, but do need to construct, preferably through a thoughtful process of critical enquiry, reflection and dialogue, their own understanding of sustainable development that can guide them in their curriculum planning and teaching (p279).

How *colleges* choose to respond to the challenge of addressing learning for sustainability can be manifest in a number of ways. Outside of the curriculum, as already suggested progress seems varied, from the greening of estates, to sustainable procurement and effective sustainability reporting and governance. However, the challenge of providing learning and teaching staff with the knowledge, skill, and desire to transform the curriculum must not be overlooked nor its demands underestimated. This is critical because,

after all, it is their own understanding of this concept that will shape their pedagogical practices in ESD. In the absence of such understanding, teachers are likely to find it difficult to help young people acquire a sense of their place in co-constructing a sustainable society (Stevenson, 2006, p279).

The problem to overcome here is how to provide educators with the knowledge and values to understand sustainability concerns so they can effectively deliver sustainability concepts to others. This is why the central core of my methodology has included throughout a determined strategy on how to provide educators with such sustainability knowledge and skills. This progress is required so that educators not only help inspire these values in

others, but also ‘can contribute to such important questions as: How can issues of environment and development be connected to students’ lives?’ (Stevenson, 2006, p287). This is why my learning and teaching materials are designed to enable students to make informed decisions on how to live more sustainable lives, not only in their chosen career paths but also in their lives in general. I am forever conscious of this dual focus of my doctoral enquiries: championing unreservedly and innovation designed to further the objectives of ESD whilst researching and investigating the broader range of such innovations in order to ascertain and promote those that are likely to be most successful.

Educational transformation is one of the answers to environmental issues, provided it is clear what requires to be transformed. Although I know what I am trying to transform with my work, in order to be successful I need to influence the decision makers and also determine an effective methodology to ensure that the transformation makes a difference. In order to reshape current practice within Scotland’s Colleges ‘sustainability initiatives can make use of existing or new structures to bring about change’ (Hoover & Harder, 2015, p181). If there are no existing structures, or if they are complicit in the obstruction of educational change, then new ones need to be designed and created. However, ‘as most HE institutions do not follow structured models or processes to integrate sustainable development’ (Verhulst & Lambrechts, 2015, p190), there is an obvious need to formulate new decision making systems capable of facilitating more effective sustainable practices. I would argue that this is in fact a critical issue in Scottish College education, because what the Scottish Government advocates and showcases on the international policy platform does not appear to have translated into practice in colleges.

The lack of appropriate ESD learning and teaching materials has been identified by Stevenson (2006) as a major deficiency. He advised that ‘materials are not currently accessible or available to most educators in a form that is relevant to primary and secondary students or that can be readily adopted for use in school classrooms’ (p279). This is of course the issue I am trying to resolve in Scottish college education because, in many of the same respects, the materials are not available in a format relevant to what they aspire to teach. Furthermore;

if ESD overcomes what are perceived to be significant limitations of the problem-orientation of environmental education’ ... ‘then the expectation should be that ESD becomes more prevalent in schools than environmental education has been.

Yet, thus far, there is no reported evidence for this in primary and secondary schools or in postsecondary education (Stevenson, 2006, p285).

So the ‘limitations of environmental education’ have not been overcome by the simple introduction of ESD in areas of Scottish education such as its schools. Yet at the same time, both ESD and environmental education, have been described as ‘the most all-encompassing educational ideology’ and ‘the most radical pedagogy shaping global society’ (Spring, 2004, p. 100). This claim lays heavy burdens on both areas, anticipating their eventual emergence as a new paradigm for reframing the conceptual and practical architecture of education. These are very high expectations to impose on any discipline and it is difficult to see evidence of major advances being made. Although there has been progress, particularly in Scottish primary education since 2004, I would argue that there is still limited evidence of both environmental education and ESD achieving this new synergy in postsecondary education in Scotland.

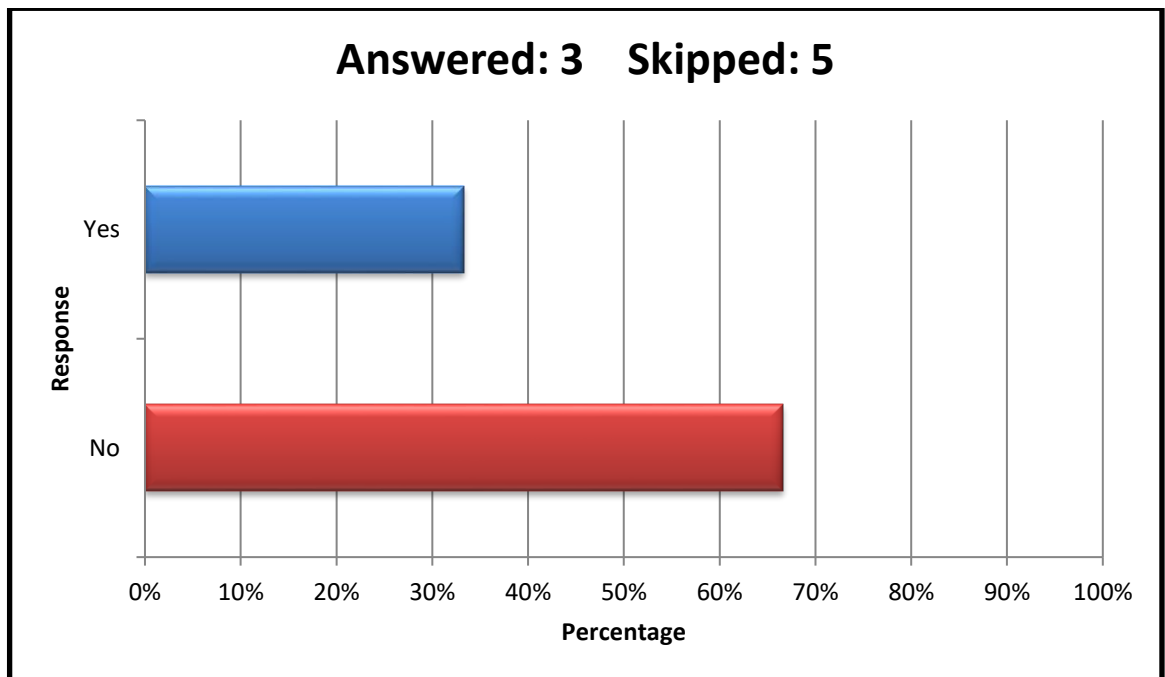
How to move beyond the limitations of environmental education as currently configured, and successfully progress to learning for sustainability, is the current curricular dilemma. ‘Few environmental educators I imagine would argue with this task which is particularly pertinent given that teachers need to try and make connections to students’ lives’ (2006, Stevenson, p285). In my teaching materials I endorse an integrationist approach, as I make sustainability links to both generic aspects of student’s everyday life along with specific links to disciplines of the college curriculum and areas of employment. However, even with the best classroom resources, this synthesis will not be achieved by well-intentioned and committed environmental educators alone. Much more is needed, such as;

policy discourse can provide a framework for local initiatives, decontextualized international policy statements must be recontextualized, after being mediated through national, provincial/regional and local policies (related both specifically to ESD and generally to educational reform) by educators at the local level (Stevenson, 2006, p287).

Furthermore, as Stevenson (2006) also notes, ‘in the decade ahead, there is a need for identifying and creating spaces for engaging educators in the discourse so it is constructed *with* them rather than *for* them’ (p288). His demand that ‘discourse should also be informed by practitioners and practice’ (Stevenson, 2006, p287), is echoed in my ambition to collaborate directly with staff in the colleges themselves to better understand how the

learning and teaching materials can be further refined to ensure they are effective vehicles of educational change.

**6. Have you obtained any feedback from anyone who has completed the *Introduction to Sustainability Workbook*?**



***Figure 5.5 - Feedback Obtained about the Workbook***

Only one college responded that they had obtained feedback from users of the *Workbook*, which is the college where I am employed. I also have feedback from one other college that responded to the survey. This is the college where the respondent has no knowledge of the materials. However I have in fact worked extensively with this college. The feedback from both of these colleges will be presented in the next chapter as case studies.

- 7. If you have not used the *Introduction to Sustainability Workbook*, what actions would make you more inclined to use it?** (For example, support from a Project Consultant for the ESD Project in Scotland's Colleges or if the materials were credit rated?)

**Table 5.5 - Comments about actions Required to use the Workbook**

Comments Received in Response to Question 7
'I need to source this workbook and ensure it is shared with our teaching staff'.
'Would need more information'.

Providing appropriate funding for colleges to develop learning for sustainability, and incentivising its circulation throughout the campus, curriculum and wider community, could be one important catalyst in persuading college Principals to adopt a holistic view of sustainability. However, it would be important to ring-fence such funding to guarantee it is 'reaching the grassroots and tangibly addressing community-based initiatives' (Leal Filho *et al.*, 2015, p122). As already established, funding from the SFC for the *ESD in the Scottish College Sector Project* was patchy and piecemeal. Initial funding to Scotland's Colleges, was followed by a period of over six months with no funding, before the project then continued with the EAUC. During this interim period, there was a real danger that any momentum gained, and any progress made in the sector to that point, would be lost. The Project has now ended, and the EAUC now receive generic funding for their work with universities and colleges in Scotland. Topic Support Network events, it should be noted, organised by the EAUC for the tertiary education sector are always better attended by HE staff and students than by FE. This is where it needs to be recognised that sustainability funding earmarked for colleges may have a more beneficial impact than undifferentiated HE funding. There is a danger in universities that resources might be 'siphoned off to fund "experts", reports and documentation that, while using all the appropriate terms and buzz words, further alienate the world community from the urgent matters' (Leal Filho *et al.*, 2015 p122). This leads me back to my earlier observation that colleges oftentimes can drive community engagement projects, which inform the wider community about sustainability, significantly more effectively than universities because of their generally better grassroots connections (Wals, 2014).



It is also interesting to observe that Principals might be further persuaded if ESD were made a compulsory requirement for community engagement. The United Nations (2010, 2012, 2013) has repeatedly recognised that there is recurrent concern over the slow and inconsistent progress of ESD, and even more worrying is the unease that unless progress dramatically increases there is a risk of undoing or even reversing the progress made to date. This would also appear to be a real danger in Scotland's Colleges, where there is a mounting impression in some quarters that sustainability has been efficiently addressed and ESD is now seen as complete, allowing the institutions to move on to the next target.

To overcome the problem of the slow pace of sustainable development and ESD, the UN provided guidance in an important document entitled *The Future We Want*. The document advises, 'we therefore acknowledge the need to further mainstream sustainable development at all levels, integrating economic, social and environmental aspects and recognizing their interlinkages, so as to achieve sustainable development in all its dimensions' (United Nations, 2012, p2). One of these dimensions is education and the UN further states:

We recognize that the younger generations are the custodians of the future, and the need for better quality and access to education beyond the primary level. We therefore resolve to improve the capacity of our education systems to prepare people to pursue sustainable development, including through enhanced teacher training, the development of sustainability curricula, the development of training programmes that prepare students for careers in fields related to sustainability, and more effective use of information and communications technologies to enhance learning outcomes. We call for enhanced cooperation among schools, communities and authorities in efforts to promote access to quality education at all levels (2012, p44).

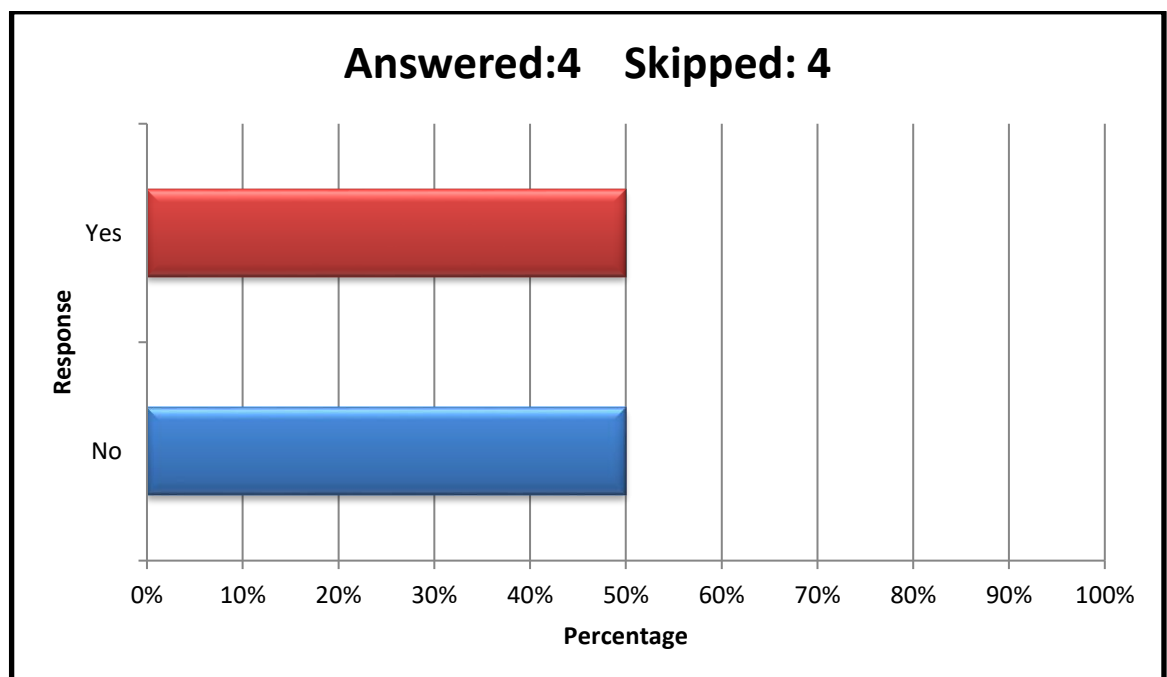
Leal Filho *et al.* (2015), believe that to honour the promises made in *The Future We Want*, we need:

- suitable financial resources;
- better coordination systems with clear indicators and deliverables that may allow progress to be monitored and assessed;
- a strong emphasis on best practice that may be replicable; and

- a stronger involvement of the higher education community that may initiate a chain reaction that improves ESD provision in formal, non-formal and informal settings (p126).

On an optimistic note UNESCO believes we are well on the way to meeting these requirements in Scotland and they have reported the current status of ESD in just those terms: ‘in Scotland, there is greater focus on a more integrated and coherent approach to sustainable development and ESD with education being recognized by policy makers and practitioners as a key enabler in the transition to a sustainable society’ (UNESCO, 2013, p4). This domain may be essentially the focus of policy makers, but in the present research there is limited evidence of these congratulatory principles being meaningfully translated into a policy agreed, adopted and delivered by senior management within Scotland’s Colleges. Moreover, in an age of educational austerity and staff reductions, ESD practitioners are increasingly thin on the ground in Scottish College education.

#### 8. Do you have another resource you use to introduce sustainability to your staff?



**Figure 5.6 - Staff Sustainability Resource**

Only one college provided details of what resource they use to introduce sustainability to their staff, the other college that advised they have a resource did not advise what it is.

**Table 5.6 - Comments received about Staff Sustainability Resources**

<b>Comments Received in Response to Question 8</b>
'Awareness raising sessions with staff about our Carbon Management Plan'.

It is generally agreed that all potential avenues should be utilised to embed learning for sustainability, both within the curriculum and educator pedagogy. The use of Carbon Management Plans (CMP) is one such possible route. The resourcefulness required by sustainability staff has been recognised, evidenced by McCoshan and Martin (2014) who concluded that 'sustainability teams are acutely aware in the leading edge and experimental nature of many of the changes they are trying to introduce' and 'tend to be opportunistic' (p4). They point out also that 'this is a necessary part of their position within institutions and their small resources' (McCoshan & Martin, 2014, p4). McCoshan and Martin (2014) are referring to 'sustainability teams' in British universities. Although these teams face challenges sometimes making their jobs difficult, their very existence within the universities is a major gain. In Scotland's Colleges, by contrast, there are no 'sustainability teams', and only a handful employ a member of staff who has the specific remit of 'sustainability'. British universities also have a further advantage over FE because of 'the high degree of autonomy... which means that sustainability teams therefore seize any opportunity they can to influence developments' (McCoshan & Martin, 2014, p4). This evidence strongly underlines the need for a critical mass of active ESD practitioners available to 'seize any opportunity' presented to the institution. Unfortunately, this is not the case in the majority of Scotland's Colleges.

An opportunistic, reactive approach does have merit and I utilise it wherever I can to implement learning for sustainability. For example, I work with the Student Association to help reduce the college's carbon footprint – by campaigns such as water and energy saving initiatives. This aids my role as the Climate Change Officer responsible for the college's carbon management. However, I know I am in a unique position, being the only employee in a Scottish college who has been employed in the joint roles of learning for sustainability across the curriculum and the college's carbon management. Possession of that level of autonomy has aided development in the college where I work, because to a certain extent I have been given a free reign to tackle the issues as I see fit. However, the downside of this 'freedom' has been a lack of appropriate support from my manager, a senior member of staff, who did not tell teaching staff they had to engage with me or use the materials I had

developed. This meant I really had to market it in some areas of the curriculum and ultimately was constrained to work only with those staff that chose to engage with me. This problem would have been assuaged if the senior staff member responsible for the curriculum had devised appropriate college policy to ensure learning for sustainability could not be ignored by teaching staff.

‘In some cases institution-wide curriculum change processes are reported to have had a lukewarm reception with staff and students, thereby failing to provide fertile ground for the introduction of sustainability’ (McCoshan & Martin, 2014, p6). I have not experienced negativity on quite this major scale, at my own college or any other. There are a number of reasons for this including;

- I have not had the opportunity to implement institution-wide curriculum change at the college where I am employed partly because of a lack of senior management support.
- I have not had the time to implement change on this scale owing to part-time, term-time working hours.
- I have not been involved in such an exercise at any other institutions.

Even where I have encountered some negativity from staff or students it has been in isolated pockets and has certainly never been an entire class or curriculum area. I have found that most staff are willing to engage with sustainability but sometimes they are not sure how to do so. Often at the end of the staff learning for sustainability sessions that I have delivered, those colleagues who began the session sceptical have indicated they are now much more open to considering sustainability in their learning and teaching. Another reason for an initial ‘lukewarm reception’ may be because staff do not always see where sustainability is relevant to their discipline. Is it lack of confidence, or insufficient leadership, or political rejection?

## **Reflective Diary Extracts**

### **February 2012**

I attended a staff development session for the business department [at Case Study College A]. A business lecturer at this college was quite hostile at the start of the session and advised me that it ‘was a waste of her time’, but by the end apologised to me for her attitude. Her Higher National Certificate Business students were doing a pub quiz as an enterprise project, but she told me she wished this session had been earlier as she would have advised them to do a carbon accounting project instead. Why was the lecturer like this? I got the feeling when the session started that she was of the opinion that her time could have been better spent catching up with her admin than attending a training session she was told she had to attend. I have seen this in my own college, when it is non-student days, like this week which was half-term, lecturing staff get a chance to catch up without students being around, but this is often when colleges look at providing staff development. This lecturer, I feel, was hostile because she objected to being told she has to be here, she told me these sessions should not be mandatory, as if it was my decision to make her attend. When her attitude changed, could it be because she already had sustainability values anyway, so she was not hostile to the content of the session, but hostile to being made to attend it. I believe this is the case because I believe most of us do have sustainability values but sometimes other objectives just get in the way.

### **May 2012**

One senior member of staff (Head of Faculty for Health and Social Studies) [at Case Study College C], advised me that addressing sustainability worked with vocational students who could look at recycling and energy use, but that it was irrelevant to academic subjects. After I discussed environmental ethics, social justice, and environmentalism as a ‘luxury of the middle classes’ which may be socially constructed, she changed her mind. Now [March 2016] her faculty area is one that engages with learning for sustainability more robustly than most other areas of the college. Why did the shift happen here? Was it down to me, or was it because just like the lecturer in the previous example, her inherent sustainability values and ethos were given room to develop when they were provided with an appropriate platform to do so.

The illustrations above are more than just anecdotal because they accrue a frequency and consistency in my experience, that typify certain patterns within the sector, which is not evident in the data collection. Furthermore, it raises a critical question; what factors account for the widely varying rates of engagement with, and commitment to ESD among academic staff?

### **Further Impacts of the Learning and Teaching Materials across the Sector**

The ESD learning and teaching materials I developed have had a wider impact than acknowledged by the survey results. The *Workbook* project, as well as forming part of the research project, was also initially a commercial venture by the college where I am employed. During the college session 2012-13, when the first *Workbooks* were developed, the college offered them for sale to other colleges. At this time, seven colleges purchased sustainability materials that I had developed. At this stage, Scotland's Colleges then intervened and purchased the overall right to the *Introduction to Sustainability Workbook* (Appendix IV) and the *Hairdressing Heroes Workbook* (Appendix IV), from the college, for general use free of charge across the sector. Colleges that had purchased the *Workbooks* directly from the college were reimbursed. Of the seven colleges that purchased materials, only two responded to the survey. One of these colleges was a case study, which advised incorrectly they had not used them (see Figure 5.1 and explanation that follows). The other college advised that ESD had no priority in their college and they skipped the question asking if the materials had been used (see Table 4.5 and Figure 5.1). However, this college had purchased both of the *Workbooks*, at two separate college campuses, prior to the merger. This indicates that the college mergers were not only problematic in terms of staff continuity, but also that merged colleges may not have necessarily been aware of initiatives within all individual institutions that became one merged college. There existed the alarming possibility at that time that sustainability work which had been started may have been disrupted or even stopped altogether. At the very least, the evidence of this research strongly suggests major communication problems internally and externally. Unfortunately, the survey responses supporting my anxieties about a breakdown in ESD workflows were left by an anonymous member of staff who did not advise their job title either, so I have no way of knowing at what level of college responsibility this information has come from. However, I do think it is clear that the person who completed the survey has no knowledge of sustainability initiatives within their own college, meaning they could be an acting Principal from another college, or a new Principal or another new member of staff the survey was delegated to.

Taking this information into account, this means that a total of nine colleges (eight post-merger) have either:

- confirmed they have used the materials,
- been a case study so I know they have used the materials,
- or purchased the materials which would indicate they intended to use them.

This is much more positive than the survey results have suggested. College curriculum staff who had purchased the materials initially would probably have required permission from a senior level to do so. This is actually quite encouraging because it may indicate that the sustainability ethos was positive prior to the mergers but then other considerations got in the way, slowing the progression of learning for sustainability. Nevertheless, there is also the spectre that the passionate staff on the ground, the ‘sustainability champions’, who are driving sustainability more than senior management colleagues in some colleges, may have been the same staff who have subsequently left the sector as a result of the changes.

I am also aware from other sources with which I work at the EAUC, and by direct requests made to me, that the learning and teaching materials I developed were obtained by four universities in the UK, two in Scotland and two in England. How or if these universities have used the materials in any manner, has not been included within the remit of this research.

There is also a bigger picture to consider on the impact I may have had upon ESD ‘cultures’ in Scotland’s Colleges. The *Workbooks* were the main reason I have been involved in other projects, since developing the *Workbooks* gave me contact with Scotland’s Colleges and the EAUC. This in turn led to my involvement in other learning for sustainability initiatives within Scottish FE. Largely as a result of these initiatives, I was invited to be part of the Learning for Sustainability Steering Group, chaired by College Development Network initially (CDN), and then CDN with Learning for Sustainability Scotland. As a result of this I have been involved in other curriculum developments. For example, I wrote the tutor pack for the Sustainability Unit of the National Progression Award in Food Manufacture, and the supporting e-assessment for the Unit for the Scottish Qualifications Authority.

I have also presented at many events organised by Scotland’s Colleges, the EAUC and Learning for Sustainability Scotland, which have resulted in me conducting nearly 30

different learning for sustainability development sessions at 15 college campuses across Scotland. This has enabled me to interact with hundreds of staff and students. All of these presentations and staff development sessions have included the approaches used, and information and activities from the *Workbooks*. These sessions were always very well received, and where feedback was gathered, it was largely positive. Information about some of this work will be presented in the next chapter.

### **Reflective Diary Extract**

#### **May 2013**

My thoughts about ESD development in the college where I am employed remain mixed. Two Heads of Faculty that I have to convince remain sceptical, one particularly so as her faculty includes construction and engineering, so in her opinion 'ESD is not required as legislation covers it'. Another Head of Faculty was initially very sceptical as she did not consider 'sustainability to be academic because it is about recycling', however she is starting to engage more and I have discussed climate change with care students and how climate change will impact those they care for and the NHS, at her request. The two other Heads of Faculty are much more receptive. Education Scotland found us to be sector leading in our ESD work at our last review, however I feel this is because they were just shown the areas of the curriculum where ESD has been incorporated and I know there are still many departments where it is not considered. However, on a positive note, as a result the Principal now wants the workbook materials to be adapted into Moodle courses and credit rated.

#### **April 2016**

Reflecting back over the years, what was positive progression at the time has stalled. Although work took place to adapt the materials into online resources and some were credit rated, they have never been formalised into the curriculum. Whether lecturers engage with the materials or not, is left entirely to their own discretion, and it continues to be the same sustainability innovators that find space within their teaching to incorporate ESD. This suggests, as already implied, a lack of strategic management, evidenced by the Principal telling me that the SFC had moved on from sustainability and social inclusion was now the area of focus.



## Conclusion

The college survey was designed to answer specific research questions: first to measure the extent to which ESD is embedded within Scottish FE, the knowledge that senior management holds in relation to ESD and the importance they afford it, as presented in the previous chapter. Secondly, as discussed in this chapter, the survey aimed to investigate if I could produce ESD learning and teaching materials that have a positive impact upon the progress of ESD in the sector. Owing to the lack of literature concerning ESD progression in Scottish Colleges, and limited research on the subject to date, it is difficult, if not near impossible, to know if my survey results are representative. The low response rate also means, unfortunately, my results cannot be considered comprehensive of the sector. From the lack of response, and the limited information available, and my own experience in the sector, I think it is fairly accurate to assume that ESD development in the curriculum is limited and erratic. However, I do know that more colleges than are represented in the survey have engaged with the Workbook materials that I have developed and used a variety of the activities in them with students. Where ESD is being positively engaged with, it is still a relatively recent development, and only conspicuous in those institutions actively choosing to engage with it. It may well be in other colleges, it is either not considered at all, or is not explicitly considered but nonetheless exists under other banners such as global citizenship or social justice, making the apparent lack of progress essentially a misunderstanding of terminology. A further problem accounting to the slow rate of progression may be the lack of strategic importance attributed to ESD. In addition, in the UK considered holistically, ESD development tends to support curriculum change in HE and has not necessarily altered the curriculum in vocational learning to anything like the same extent. It is therefore not unreasonable to claim that ESD reform is still in its infancy in Scottish FE.

The survey only represents a snapshot of ESD at that time, over a period of a few months, and in places uncovers more questions than answers. However, it is important to remember that ‘embedding sustainability is not a quick fix’ (McCoshan & Martin, 2014, p16). Although I have been working on embedding learning for sustainability in the Scottish College curriculum for a number of years, and have witnessed a lot of positive progress, there is still a considerable amount of work required.

## **Chapter Six: Approaches to Embed Learning for Sustainability – Staff and Student Perspectives and Responses**

### **Chapter purposes**

- To explain the case study processes at the three participant colleges.
- To present the results from the case studies.
- To appraise the impact of my interventions in furthering the progression of education for sustainable development (ESD) within the case study colleges.
- To evaluate staff and student opinions of sustainable development and my approaches in order to overcome the barriers that exist to embedding ESD in the curriculum.

### **Introduction**

Our biggest challenge in this new century is to take an idea that seems abstract – sustainable development – and turn it into a reality for all the world's people.

(Kofi Annan, Secretary General of the United Nations 1997-2006)

Chapters Four and Five established the current landscape of learning for sustainability in Scotland's colleges in relation to senior management attitudes and strategic dispositions. This Chapter aims to continue this line of enquiry relating to, first, staff and student perspectives on learning for sustainability in general, and secondly, staff and student's perspectives in relation to my approaches and teaching materials. These elements will be captured by a two pronged approach: the first approach focuses on the empirical data collected and the second approach aligns the data with my own reflective practices and experiences to provide a holistic view of learning for sustainability within each of the case study institutions. I have stressed throughout this research that I am an active and interested participant in the network of agents and institutions supporting the promotion of ESD. This Chapter therefore also involves critical analysis of my own contributions and interventions.

The learning and teaching materials I have developed, and the methodology employed, aim to develop knowledge of sustainability in relation to course provision in Scotland's Colleges. At the same time, I also hope to inform staff and students of areas in their

individual professional lives where sustainability values can have a positive impact in order to live a more sustainable life. Leal Filho (2011) argues that a holistic approach to sustainability teaching enhances not only the quality of the education, but also the rigour of research, and consequently there is a need to translate ESD theory into meaningful professional practice. By providing practical knowledge and activities related to the student's chosen employment, which translate also into life skills, I aim to address holistically learning for sustainability in a fashion which supports the transformation of my ESD theory as a writer and activist into their vocational practice. Cotton *et al.*, (2015) believe that both sustainability itself, and sustainability literacy, encompass a potentially enormous agenda, and that perhaps both gain greater utility when operationalised into specific zones of educational experience and academic and professional development. To gain utility, my learning and teaching materials, where possible, are operationalised into *curriculum specific* areas – for example, reducing energy use when using electrical hairdressing equipment. This is intended to initiate the turning of the 'abstract idea of sustainable development' into a practical reality for staff and students in Scotland's Colleges.

Three colleges were chosen to participate in the Case Studies. College One was chosen because an opportunity arose to work with this college after I delivered staff sustainability sessions during the college's staff development week. College Two was chosen because they have a committed sustainability champion who requested I work with staff and students in her department to further sustainability work they had already started. College Three was chosen as this is the college where I am employed and the main aim of my employment, at that time, was to embed sustainability in the curriculum.

These colleges therefore deliberately represent institutions positively pre-disposed, at the strategic level, to the attainment of the ESD goals. While they may not be representative of the sector as a whole, their declared commitments to the agenda showcase the sector at supposedly its most fertile. This provides a rich context for examining the promise there may be in leading areas of the sector for the realisation of ESD objectives in the manner understood throughout this study.

## Case Study 1 - College A

My relationship with this college started as a result of Scotland's Colleges being requested to deliver some training for them during their staff development week. The college requested training from Scotland's Colleges on a range of topics, including sustainability. I was invited to deliver two sessions in the college as part of my role as a Project Consultant on the ESD in the Scottish College Sector Project, which was managed by Scotland's Colleges at the time. The sessions were well received and one of the senior members of staff requested if I would do further sessions with other staff. As a result of this, I completed a total of 8 sessions at this college, over an 18-month period, engaging with over 100 staff. This college had a committed 'sustainability champion' and I requested if I could work with some of her students as a case study to trial some learning and teaching materials I had written for the Hairdressing curriculum. This was agreed. However, as this college did not have Hairdressing in the curriculum at the time (pre-merger), they agreed they would use the *Hairdressing Heroes: Fighting the Carbon Battle Workbook* (Appendix V) with Beauty students. This was possible because many of the chapters in the *Workbook* are generic or could be easily adapted to suit the Beauty curriculum also. For example, the chapter considering energy use could be changed to electrical beauty equipment instead of hairdressing equipment, and the use of products and water and the production of waste apply to both the beauty and hairdressing industries.

I attended the college to deliver an 'Introduction to Sustainability' lecture to the students (February 2013). This was to not only introduce them to the concepts of sustainable development and sustainability, but also to explain why as beauty practitioners they need to be aware of them. After the lecture, the students completed a questionnaire (Appendix III) to gauge their thoughts and existing knowledge of sustainable development. I also met with the staff who would be delivering the 'sustainability lessons' to the students, using the *Hairdressing Heroes Workbook* (Appendix V) materials.

## Student Opinions of Sustainable Development in College A

The students completed the questionnaire (Appendix III) after I presented an initial sustainability presentation to them but prior to them using the *Hairdressing Heroes Workbook* (Appendix V). The same questionnaire was then to be completed again after the students had finished the *Workbook* to see if their opinions had changed. However, at this college, the pre-intervention questionnaire was completed before using the materials but the post-intervention questionnaire was not. I believe this was largely as a result of the

disruption caused in the sector due to the college restructure. During this time the sustainability champion at the college, who was a senior member of staff, was made redundant. Curriculum staff would not reply to my emails over a period of a few months.

The entire Beauty Department students were requested to take part in the research process. This was a total of 29 students, however 5 declined to be part of the research process. The 24 students who agreed to participate in the research process consisted of 10 National Qualification students and 14 Higher National Certificate and Higher National Diploma students. The students were advised they did not have to take part in the research, however those who declined would still have to complete the *Workbook*, along with the rest of the students, as this would form part of their coursework.

The responses from the questionnaire now follow.

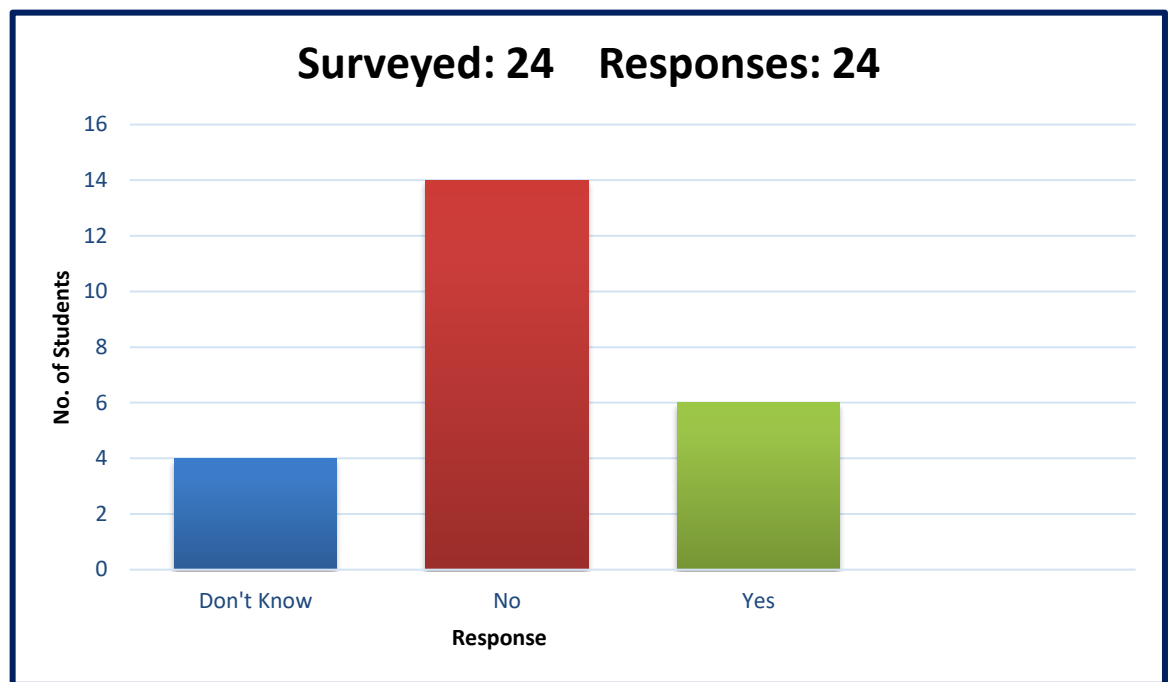
**Q1. What does sustainable development or education for sustainable development mean to you? (leave blank if you are unsure)**

*Table 6.1 – Student Opinions of Sustainability and ESD (1)*

<b>Student</b>	<b>Responses Received from Students (24 surveyed, 11 responses)</b>	<b>Do you think Sustainable Development Should be Included in your Course?</b>
<b>1</b>	I am interested in it as I have children	No
<b>2</b>	Making products that help the environment	Yes
<b>3</b>	Continuous development or maintaining, like keeping a job or developing to keep a job and hold a job down!	Don't know
<b>4</b>	Unsure	Yes
<b>5</b>	Sustainable development to me, means that you can continue with development and progression to maintain/achieve what your goal is	Yes
<b>6</b>	I don't know	Don't know
<b>7</b>	How to live in the earth without harming it	No
<b>8</b>	Continue to make things work that are achievable	Yes
<b>9</b>	Environmentally friendly	No
<b>10</b>	Yes I am aware of it as part of my course we are made aware because we use these resources (easy dry towels)	No
<b>11</b>	Think it is a good idea as we are aware as we use less of the stuff that isn't good	No

Of the 24 students who agreed to take part in the research, only 11 chose to reply to this question. I have also included their response to the next question, 'Do you think sustainable development should be included in your course? This is to determine, if at this stage, they believe there should be a link between sustainability/ESD and their area of study/employment.

**Q2. Do you think sustainable development should be included in your course?**



**Figure 6.1 - Should Sustainable Development Be Included in your Course (1)**

All 24 students who took part in the research answered this question. A number of students changed their answer to this question. Three students initially answered 'yes' and then crossed the answer out and changed it to 'no'. A further 2 students also changed their answer, one from 'yes' to 'don't know' and one from 'don't know' to 'no'. This did not happen for any other question on the questionnaire. There is no way of knowing if the altered answers in these instances are a true reflection of that student's opinion, and if they changed their answer due to peer pressure. Interestingly, no-one crossed out 'no' or 'don't know' and changed it to 'yes'. This raises the question, why were the altered answers not changed to a more positive response?

Students who provided a response to Q1, (Table 6.1), may have provided a response because they felt they knew something about sustainable development or ESD. I wanted to establish the students' opinions before they had access to the learning for sustainability materials because I believe there is the need to take into account existing views, especially given the widely held academic recognition that 'there is no such thing as a single unified philosophy of sustainable development' (Hopwood *et al.*, 2005, p47). Before asking this question, I inclined to the belief that those who had prior knowledge would be more likely to want ESD included within their learning. However, the responses strongly suggest very varying positions among those questioned and there is no one clear articulation provided.

Another obvious factor here was anticipated by Dawe *et al.*, (2005) whose research at Kingston University discovered that staff worried that students would find sustainability materials to be irrelevant to their studies. It is easy to interpret my tentative preliminary data as an initial confirmation of this same tendency.

**Q3. In what areas of your course do you think sustainable development would best fit? (leave blank if you are unsure)**

**Table 6.2 – Sustainable Development Best Fit (1)**

<b>Responses Received from Students (24 surveyed, 4 responses)</b>
Towels
Using less products and equipment
With the products/resources we use
Products, plinth covers, disposable towels etc.

**Q4. What have you been taught about sustainable development in your course already? (leave blank if you are unsure)**

**Table 6.3 – Previous Sustainable Development Teaching (1)**

<b>Responses Received from Students (24 surveyed, 3 responses)</b>
Unsure
To be careful with product waste
To be aware of how much electricity/water you are using

From the answers provided, and the number of respondents, the students at this stage do not appear to have considered sustainability in any great detail, or to have encountered much ESD on their course beyond resource efficiency. Completing the *Workbook* may have ultimately been proven to be beneficial in resolving this because ‘modules can be an important way of introducing sustainability into the curriculum’ (McCoshan & Martin, 2014, p10). However, getting the module content right can be difficult and complex, particularly if the ‘module was outside the comfort zones of students and was perceived as too risky since it did not build on existing knowledge’ (McCoshan & Martin, 2014, p11). These insights may afford some kind of provisional explanation for the student view that sustainable development should not be included in their course (Figure 6.1). Given that they had not already been introduced to sustainable development in any educationally



rigorous manner, the concept could indeed be outside of their comfort zone, leaving very little existing knowledge to build upon at this stage.

**Table 6.4 – Further Sustainability Questions (1) – Pre-Intervention**

<b>Questions 5 – 9 (24 surveyed, 24 responses)</b>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
Q5. Have you heard of the United Nations Decade of Education for Sustainable Development?	0	22	2
Q6. Does the Scottish Government have a policy on education for sustainable development in Scottish college education?	3	3	18
Q7. Have you heard of or had contact with the Environmental Association for Universities and Colleges?	4	16	4
Q8. Have you heard of or had contact with People and Planet?	5	16	3
Q9. Does your college have a policy on sustainable development or sustainability?	6	1	17

In this instance, students are largely unaware of sustainability governance and guidance, both globally and nationally, as no students were aware of the UNDESD and only 3 knew the Scottish Government has a policy on ESD in Scottish college education. However, slightly more students were aware the college has a policy on sustainable development and have also had contact with, or have at least heard of, the EAUC and People and Planet. Whether being aware of, or interacting with these initiatives, can help drive sustainability within an institution will be evaluated in detail later. Nevertheless, the seemingly striking levels of low engagement demand even at this stage some interim assessment.

Explanations why hardly any of the students are aware of these initiatives may lie in some or all of the following:

- The turbulence in the Scottish FE sector at the time of questioning.
- A disconnect between executive strategic planning and classroom implementation.
- A disconnect between the academic focus of the college and the vocational environment.

The fact that so many of the students are ignorant of these things has to be a cause for concern and could highlight a strategic amnesia between what is known and what is conveyed to students.

After scrutinising the college's Environmental Sustainability Policy, it is evident the curriculum is considered throughout it. The Policy has adopted the 'four C's' approach of curriculum, campus, community and culture advocated by Hopkinson *et al.*, (2008), which appears to indicate whoever wrote the Policy had knowledge of methodologies to embed ESD within the curriculum. The Policy states that 'environmental sustainability is central to the College commitment to lifelong learning' and 'environmental sustainability is promoted and supported in all aspects of the College's provision'. This includes: college staff promoting environmental sustainability; the inclusion of environmental sustainability in the design of curricula and the recruitment of learners; learners being encouraged to understand and value environmental sustainability, and; the inclusion of environmental sustainability in college strategies and policies. The interactions I had with this college pre-merger would appear to support this to a certain degree because the college requested I deliver so many staff sustainability development sessions and agreed to take part in the research. However, the fact that most students were unaware of this policy still suggests there is further work required to correct this disconnect. Furthermore, post-merger there is evidence that this positive sustainability culture was damaged.

Once the students started working with the *Hairdressing Heroes Workbook*, I was unable to make contact with curriculum staff as they would not respond to my emails.

Unfortunately, this research began just prior to the merger process at this college which involved the college merging with two others. During this time, my main contact, who I would describe as the *Sustainability Champion*, and who was a senior member of staff, took voluntary redundancy. Once the mergers were completed, the curriculum contact I had then contacted me. During the merger period the three college Beauty Departments were streamlined, and my contact was unsure of her own future employment, which explained the lack of response. I met with the staff afterwards to discuss the workbook, however, the students had unfortunately finished their course by this stage and they had not been given the questionnaire to complete after using the *Hairdressing Heroes Workbook*. When I met with staff, the feedback was very positive, however, there was evidence everywhere of the rationalisation and loss of expertise and coherence.

The relationship I had with this college during and after the research period was very interesting. Even though I had a lot of contact with it when I delivered sustainability sessions to over 200 staff, once their *Sustainability Champion* left, my relationship with them quickly disintegrated. The college did not return the college-wide survey which was analysed in Chapters Four and Five, even though I appealed directly to their Principal,

advising him of all the previous work I had done with them. As a result of the college mergers, there was a new Principal in place, who advised he would delegate the survey, however I did not receive a response. This may be further proof that when a key person championing sustainability is lost to a college, ESD can be side-lined and that ‘for all that grassroots sustainability is important, the presence of dedicated staff brings safeguards and speedier action’ (Taylor, 2013, Chapter 12).

My individual experience, and the unusual circumstances in which it unfolded, may of course be seen as atypical and therefore non-generalizable, however, I have stressed throughout this research the interdependence of the ESD ideals and the context of rapid educational change across all sectors. Hence, while my experience may indeed possess unique features, constitutive of interference in the research process, it can also be construed as highly representative of the ongoing and intense cultural shifts affecting the identity and development of college education at this time. For example, the contact with the college in question, and how it evolved over an extended period, proves that ‘in times of change, ‘green issues’ or ‘sustainability objectives’ may seem peripheral to colleagues otherwise focused on, for example, discipline survival, research rating or institutional financial viability’ (Taylor, 2013, Chapter 12). In this instance, staff were focused on job survival and once this threat was removed staff were happy to interact with me again. The problem could have been overcome by ‘a dedicated sustainability team who could maintain impetus and, where appropriate, redesign sustainability links to ensure their continued incorporation’ (Taylor, 2013, Chapter 12). This might well have been effective in mitigating disruption during the changes in the Scottish college sector. If colleges had maintained sustainability teams their strategies may have weathered the upheavals of the period, more enduringly.

### **Staff Opinions of my approaches for ESD delivery**

As well as working with Beauty students and staff at this college, I also delivered a number of sustainability and ESD staff development sessions. Although I had not requested it, following one of the sessions, the college sent me feedback they received from staff. I decided to include this feedback in my results because the presentations to staff were based on the workbook materials and approaches. Comments provided by staff after one of the sessions is provided in Table 6.5.

**Table 6.5 – Feedback Received from Staff**

<b>Feedback from Staff after Sustainability and ESD Session</b>
She was very well organised, engaging and had a well thought out programme for us with useful links and tips for our teaching.
Very useful.
Excellent presentation with interesting Presenter who displayed great enthusiasm and knowledge about her subject. Well done Elaine.
An excellent seminar with very useful input from Elaine. She gave really good examples from across the curriculum and really everyone could see what they could do. Very helpful!
I enjoyed this presentation from beginning to end. I will find all the contents helpful.
Well-presented and informative.
Evangelistic, idealistic nonsense, muddling the facts with politics, theory with fact, and not a trace of the underpinning science. A bombastic mouthpiece for the SNP administration. Ill-informed and insulting.
Excellent CPD opportunity with lots of ideas on how to embed into the curriculum.
See the relevance of sustainability and have it embedded in units taught.
Useful and Informative.
Well-presented and useful session.
A very well presented event. Hugely impressed with Elaine's delivery and ability to energise the discussion/debate. Thoroughly enjoyed this.
Far better than other events. At least the speaker knew very well what she's talking about.
Well-presented information - Unfortunately this was all stuff that I am very familiar with having done extensive research of my own - should not have been mandatory.
Good information and links to projects and information. - The information reinforced what we are already doing in the Fashion Department.
Excellent.
This event was very good. The delivery was dynamic, interesting, informative and 1 hour was the perfect length.
Very informative, well presented.
Most things covered in this lecture are more or less built into our classes.
It was interesting and informative to link seemingly unrelated events with sustainability in the curriculum.
Very interesting course.
Very informative and well delivered.
Very interesting and informative.
The delivery was excellent and very engaging and informative. Our department has its own challenges but did illustrate how creative thinking could open opportunities which are not necessarily obvious.

From these responses, it is evident that staff enjoyed the session I provided and on the whole appear to be either already engaging with ESD in a manner similar to that which I

was advocating, or would be willing to engage with ESD in the future when provided with tools to aid them to do so. Whether they have then utilised any of the approaches I presented in their teaching has not been evaluated. However, I felt that if they were not already engaging with ESD, that they would now consider it.

There was one comment that was not positive:

Evangelistic, idealistic nonsense, muddling the facts with politics, theory with fact, and not a trace of the underpinning science. A bombastic mouthpiece for the SNP administration. Ill-informed and insulting.

While this comment was isolated, it came from an area of the curriculum normally in possession of specialised expertise in key areas such as climate change and ecological degradation. Other commentators have noted resistance to ESD stemming from alternative explanations of the environmental data and/or ideological opposition to global warming science because ‘many scientists view sustainability as the main goal, but they perceive it as a largely environmental issue, without fully reconciling the potential contribution of the ‘development’ of humanity’ (White, 2013, Chapter 8). The quotation is suggestive in this respect, because it gestures to the recurring need for curriculum specific staff development in areas where the underlying science can be explored and deliberated (Ryan and Cotton, 2013, Chapter 7). This seems especially important when that same science is so comprehensively integrated into the technological education students will receive on their college programmes. Furthermore, it enables the reconciliation of the underpinning science as not only an environmental problem, but also a social issue.

There needs to be strategies that encourage staff more generally to incorporate creativity in curriculum design in order to promote sustainability within the curriculum (Brinkhurst, *et al.* 2011). Where staff are unsure where to begin, a simple hour long presentation such as the one alluded to above from an ESD Practitioner can be an effective method to start with. It is however insufficient by itself. McCoshan and Martin (2014) established that difficult financial times in HE reflected the small scale of resources available for sustainability work. ‘Nonetheless, there remains a stark contrast between universities’ strategic ambitions in respect of sustainability and the resources actually devoted to it’ (McCoshan & Martin, 2014, p6). This is reflected in Scottish FE between the strategic ambitions of Scottish Government to embed ESD across all levels of education, and the resources devoted to it within FE.

## Case Study 2 – College B

Research at this college was undertaken with a class of HNC Hairdressing students. The students completed the questionnaire both before and after using the *Hairdressing Heroes Workbook*. The driving force for sustainability at this college, their *Sustainability Champion*, embraced sustainability, not only in the Hairdressing Department, but actively across the college wherever possible. In this college – with regards to their *Sustainability Champion* – it was very clear that ‘people started with certain initiatives because they felt responsible at a personal level’ (Verhulst & Lambrechts, 2015, p195). This was clearly evident whenever sustainability and ESD issues were raised with the *Champion*, who had driven sustainability throughout her own college and in partnership with many colleges from other countries on a European college hairdressing project. This college also, as a result of tireless campaigning from the *Sustainability Champion*, subsequently went on to create the only ‘green’ hairdressing salon in any Scottish college, and as far as I am aware any college in the UK.

My relationship with this college and their *Sustainability Champion* started not long after my research began and I am still working with this college today. They are not only using the *Hairdressing Heroes Workbook*, but also workbook materials I have recently developed for the Beauty curriculum, called *Beauty Shouldn’t Cost the Earth* which students are completing as a pilot programme at the moment.

### **Q1. What does sustainable development or education for sustainable development mean to you? (leave blank if you are unsure)**

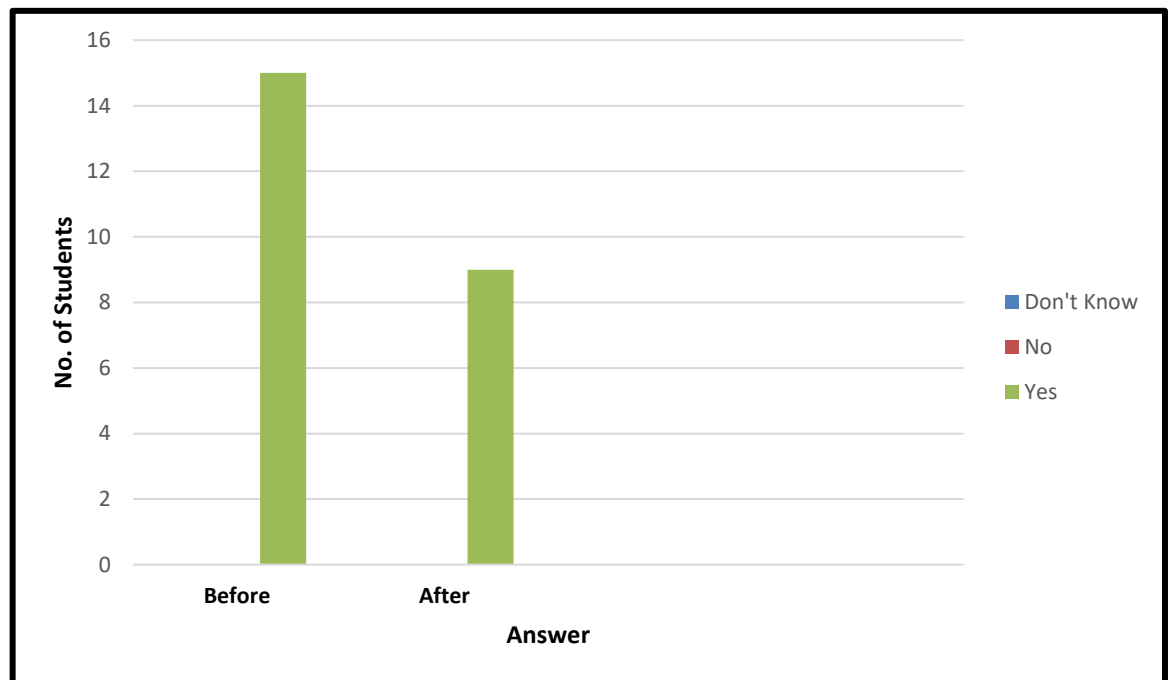
Table 6.6 shows the results received by student both before and after engaging with the *Workbook*. Before using the *Workbook*, just over half of the students surveyed provided a response, however, after using the *Workbook* all of the students surveyed provided a response. The number of students surveyed post intervention was lower as this was the total number of students from the class available on the day I returned to the college to have the questionnaire completed.

**Table 6.6 – Student Opinions of Sustainability and ESD (2)**

<b>BEFORE (15 surveyed, 8 responses)</b>	<b>AFTER (9 surveyed, 9 responses)</b>
Not wasting products.	We need to use less of everything so our children can live better. We should recycle and switch things off and think about where our food comes from.
Making sure we recycle and use less where possible, like electricity and water and hair products.	We have to recycle more or the earth will run out of resources. Also we have too much and some people don't have enough, so we have to use less in the salon and at home.
Learning to use less when hairdressing.	Hairdressing uses a lot of products and electricity so need to use it carefully.
We need to recycle and switch things off when not using them.	Recycling and saving water.
Don't waste products, only take what is needed as this saves money.	Using less of everything in the salon can save money. We can do this at home too.
We can change the taps to use less water, recycle where possible and be careful with hair colours and other products to not take more than is required.	Not to waste things or the earth will run out. Also we are making the earth hotter by using fuel in our cars and homes.
Thinking about what we use and not wasting energy, water and products.	If we don't change to be more sustainable our children will not be able to live like we do as we are changing the climate. We need to think about this at work and at home.
Only using what we need.	We can change how we live to use less energy.
	Using too much energy and products in the salon wastes money. We can reduce this and recycle to save money and change other things like how we travel and the food we eat to save money and be more sustainable.

**Q2. Do you think sustainable development should be included in your course?**

(Before: 15 surveyed, 15 responses: - After: 9 surveyed, 9 responses)



**Figure 6.2 - Should Sustainable Development Be Included in your Course (2)**

All of the students replied 'yes' to this question both before and after using the *Workbook*, although a smaller number of respondents completed the questionnaire afterwards, hence the seeming reduction in the bar graph. This is a striking difference from the answers provided by the students at College A, prior to using the *Workbook* (Figure 6.1). At College A, the majority of students answered either 'no' (14), or 'don't know' (4), as opposed to only 6 who answered 'yes' when asked if they thought sustainable development should be included in their course. This strongly suggests that the pre-existing teaching of, and commitment to sustainability were decisive in establishing appropriate dispositions towards ESD. As this Hairdressing department is very environmentally and sustainability conscious, it may be that in this case sustainable development did not prove to be 'too risky or outside of the comfort zone of students' because it was 'building upon existing knowledge' (McCoshan & Martin, 2014, p11). While there is considerable reassurance in the picture at this college, it seems very obviously to rest on one key factor: the personal vision of the Sustainability Champion referenced above. This of course raises some serious questions which will be explored later.

The relationship of curriculum to pedagogical practice raises another very sensitive aspect of ESD of direct relevance to the volatile forces at work in the sector with which I was



chiefly concerned. Blewitt (2015) commented on the values dimension of ESD and the ethical features of teaching with integrity has highlighted the need for consistency between the teachers professional practice and their personal investments. I think the personal ethics of the Sustainability Champion were clearly evident in the sustainability values of the students in this case study, however, I do believe there is danger of a disconnect if the teacher's ESD principles are not apparent. If students reliably discern a discontinuity between the teachers own statements and her conduct, there might be serious consequences for a values-laden project such as ESD. This is because:

The sustainability concept is meaningful, therefore not because it provides an encompassing solution to different notions of what is good, but for the ways it brings such differences into a common field of dispute, dialogue, and potential agreement as the basis of collective action (Ratner, 2004, p62).

**Q3. In what areas of your course do you think sustainable development would best fit?**

***Table 6.7 – Sustainable Development Best Fit (2) – Pre-Intervention***

<b>Responses Received from Students Before Using the Workbook (15 surveyed, 11 responses)</b>
Not wasting hairdressing chemicals and products, using only what we need and making sure we recycle wherever possible.
We use disposable towels because it saves having to wash them so less energy is used.
I only take a small amount of hair colour at a time to make sure it is not wasted. This saves money which employers like.
I'm not sure, think it is about waste and recycling.
We have looked a henna hair dyes as they are more natural. Hairdressers need to be careful with products in the salon because they can be harmful to health.
Make sure we recycle and use less water, energy and hairdressing products so we are not wasteful.
We have disposable towels because they are better for the environment.
It fits in all areas, we can use less water, less products and less energy.
In how we use products and water.
Not being wasteful in our practices and saving money.
We can recycle and make sure nothing is wasted unnecessarily.

Already, a more sophisticated picture is emerging here of student's existing sustainability perceptions and knowledge, when compared against the same question asked at College A (Table 6.2). First, because at College A more students were asked the question than at College B, but far fewer provided an answer. Secondly, students at College B have provided a broader range of answers, not only about the use of resources and recycling, but also making some tentative links to health and employability. At College B the Sustainability Champion had direct influence upon the curriculum within her department, which is evident in the answers provided, however at College A, the Sustainability Champion was a senior member of staff, so maybe had a more general impact upon curriculum development rather than influence at course level.

**Table 6.8 – Sustainable Development Best Fit (2) – Post-Intervention**

<b>Responses Received from Students After Using the Workbook</b> <b>(9 surveyed, 9 responses)</b>
It fits when we are washing hair, we don't waste products or water. We are careful not to leave equipment on when it is not being used. We also use products that are more environmentally friendly and we recycle.
Hairdressing uses lots of resources such as water, electricity and hairdressing products and we are taught not to waste them. We use disposable towels also which saves money as we don't need to wash them.
Anytime we are serving a customer we are trying not to waste things like water and products. We are also careful with chemicals and how we dispose of them as they can be harmful. Hairdressers can explain to people why we should use less.
We need to only use the right amount of shampoo etc., as well as other more harmful products like hair dyes. Using henna hair dyes is less harmful to the environment.
We have to think about recycling and waste because how we dispose of things can be harmful. The products we use should be environmentally friendly and not tested on animals.
Product use, recycling and saving money. This helps society and also can help your employer. We can also tell customers why it is better to be sustainable.
Sustainable development is about the environment, society and the economy. For hairdressers we can think about the products we use and how we get rid of waste. We can save money if we are careful how we work.
Making sure we don't waste things.
In how we use products and water and electricity for all of the equipment. We have disposable towels which means we don't spend hours washing and folding cloth ones.

The answers provided in Table 6.7 indicated the students did have prior knowledge of sustainable development pre-intervention, in relation to their course, particularly when compared against the same responses received from College A (Table 6.2). However, post-intervention, when asked the same question (Table 6.8), students provided more detail in their responses. Pre-intervention they were predominantly aware of the use of resources, waste and resources. Post-intervention, whilst the previous themes were still dominant, there were also other facets of sustainable development beyond resources being considered, such as limited references of societal impacts and the recognition of sustainable development as an employability skill.

**Q4. What have you been taught about sustainable development in your course already?**

***Table 6.9 – Previous Sustainable Development Teaching (2) – Pre-Intervention***

<b>Responses Received from Students Before Using the Workbook (15 surveyed, 12 responses)</b>
Recycling.
Product use and recycling.
Not to waste hair dyes and water.
To think about what we are using on clients' hair and to only use what we need. We use biodegradable towels instead of normal ones as we do not need to wash them.
Not wasting the products we use as this saves money and is better for the environment.
Hairdressing uses a lot of water and chemical and we should make sure we only use what is required to reduce waste.
A lot of the products we use are environmentally friendly but a lot of hairdressing products are not.
We have to be careful how we get rid of chemical waste as it is damaging to the environment. We refill bottles where possible from larger containers in the storeroom.
We have been taught about waste and recycling.
The disposable towels are better for the environment and not to leave equipment on when we are not using it.
Switch the electrical equipment off when not using it and recycle.
We use refillable containers and disposable towels.

Again, answers are predominantly based around the use of resources in hairdressing, from hairdressing products, to waste and recycling, and water. However, again far more students provided a response than the students at College A when asked the same question. Again, this would appear to indicate sustainability has already been considered within their hairdressing learning and teaching to a greater extent than at College A.

**Table 6.10 – Previous Sustainable Development Teaching (2) – Post-Intervention**

<b>Responses Received from Students After Using the Workbook</b> <b>(9 surveyed, 9 responses)</b>
<p>Sustainable development is about lots of things, not just hairdressing. It's about how we live our lives, how we travel and the food we eat. We need to think about what we do at work not to waste electricity and water and we can also do the same at home. If we use everything now, we will not leave resources for our children.</p>
<p>We have to think about the stuff we use at work and at home. The population of the earth keeps growing and we keep needing more stuff. We use lots of products in hairdressing and if we explain to our customers why we shouldn't waste products they can learn in their lives too. Like people have cleaner hair nowadays so we don't need to shampoo their hair twice and dry shampoo could be used sometimes instead of washing your hair.</p>
<p>We learnt about the three circles of sustainable development, the environment, society and the economy. We can apply all of these to hairdressing. If you use products carefully you save money and you can also tell customers about this.</p>
<p>Hairdressers need to be more sustainable because of the amount of electricity and water and hairdressing products and then the waste as well. We have learnt to be careful using all of these.</p>
<p>Sustainable development means thinking about how we live. We can be more sustainable in lots of ways such as thinking about where our food comes from, recycling and not leaving things on standby. In the salon we should not waste water and electricity and only use the right amount of product.</p>
<p>We have learnt a lot about products in the salon, we can save water by not shampooing hair every day and using dry shampoo in between washes. This saves energy too as you don't need to blow dry. Don't leave the straighteners on standby when not using them because they heat up really quickly anyway.</p>
<p>We are careful in the salon not to waste products like hair dye as these are expensive. We also use disposable towels which a lot of salons use as they save money. We can save money at home too by switching things off when they are not being used.</p>
<p>We are taught about recycling and saving energy and shown how this saves money.</p>
<p>We had a henna workshop which showed how dangerous chemicals could be replaced. We also get taught about why we use disposable towels and to switch things off.</p>

It was evident from the answers to both of these questions (Q3 and Q4) pre-intervention that the students had already been exposed to ESD in relation to their Hairdressing course. All of the students provided answers relating to not wasting hairdressing products and recycling packaging and limiting the use of other resources such as energy and water by switching equipment off and not leaving the taps running. There were also comments regarding the ingredients in hairdressing products and whether they were natural or not, such as henna, and if they had been tested on animals. There was not a large percentage difference in the number of responses before and after exposure to the *Hairdressing Heroes Workbook*, because pre-intervention most students left a response, and post-intervention all of the students answered. However, what is more significant, is that the *type* of answers provided for Questions 3 and 4 did not change to a great extent before and after using the *Workbook* concerning hairdressing practice, because it was clear that the students had already been subjected to ESD pre-intervention in relation to hairdressing. However, the students did expand upon their answers post-intervention, and provided answers looking at sustainability in greater detail and other areas of their lives, beyond hairdressing. This was also echoed when asked about sustainability and ESD in general in Question 1, (Table 6.6) the data did show a difference in response before and after using the *Workbook*. This may be attributable to features of the *Workbook* which addressed lifestyles concerns outwith hairdressing. Therefore, because of the sustainability champion in their curriculum department, they were already well versed in sustainability expectations and connections to the hairdressing industry, however post-intervention there is evidence of connections between sustainability thinking and also their employment and personal lives, knowledge and values.

**Table 6.11 - Further Sustainability Questions (2) – Pre-Intervention**

<b>Questions 5 – 9 – Pre-Intervention (15 surveyed, 15 responses)</b>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
Q5. Have you heard of the United Nations Decade of Education for Sustainable Development?	0	11	4
Q6. Does the Scottish Government have a policy on education for sustainable development in Scottish college education?	4	0	11
Q7. Have you heard of or had contact with the Environmental Association for Universities and Colleges?	2	8	5
Q8. Have you heard of or had contact with People and Planet?	4	7	4
Q9. Does your college have a policy on sustainable development or sustainability?	6	2	7

**Table 6.12 - Further Sustainability Questions (2) – Post-Intervention**

<b>Questions 5 – 9 – Post-Intervention (9 surveyed, 9 responses)</b>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
Q5. Have you heard of the United Nations Decade of Education for Sustainable Development?	6	2	1
Q6. Does the Scottish Government have a policy on education for sustainable development in Scottish college education?	8	0	1
Q7. Have you heard of or had contact with the Environmental Association for Universities and Colleges?	9	0	0
Q8. Have you heard of or had contact with People and Planet?	3	6	0
Q9. Does your college have a policy on sustainable development or sustainability?	9	0	0

This is an interesting part of the questionnaire. Pre-intervention (Table 6.11), the responses were similar to the responses received from the students at College A. The students are largely unaware global and national sustainability governance and guidance, and less than half were aware their college had a sustainability policy. This changed dramatically post-intervention (Table 6.12). However, the timing of the students completing the post-intervention questionnaire has to be taken into account. On the day, the students attended an EAUC Topic Support Network event for embedding ESD in the

curriculum at their college. I presented at the event as did a representative from the EAUC, an industry professional, and a research student from an English university conducting research into teaching hairdressers about sustainability. The students completed the post-intervention questionnaire after this event and therefore have been exposed to many of the concepts asked about during the day, particularly that it was the EAUC organising the event. It is no surprise that all of the students then advised they had had contact with the EAUC. Whilst these changes in their awareness of sustainability governance and guidance cannot be attributed to the *Workbook* materials, these students chose to attend this event voluntarily. This could be evidence that a varied and diverse approach to sustainability implementation with a range of different methodologies may have a greater impact than classroom learning on its own.

One point that is very interesting to note about this college, is that although I did receive a response to the Survey (Chapters 4 and 5), the respondent was not aware of this research. I met with the Principal, at his request, because he was interested in finding out more about my research and the Scottish Funding Council funded ESD in the Scottish College Sector Project. After our meeting he passed the survey to a senior staff member responsible for the curriculum to complete and it was returned to me. The completed survey advised they were unaware of the learning and teaching materials to which the survey referred. Therefore, this means the member of staff was also unaware of the sustainability work and research taking place in the Hairdressing Department using these materials.

Hoover and Harder (2015) point out that ‘while there are very positive implications of having committed and interested individuals driving the change towards sustainability, there are also more challenging aspects of having “champions” involved’ (p180). Particular challenges, are ‘in effect, such involvement requires a large amount of ‘time’, ‘energy’, personal ‘commitment’ and supportive environments’ (Hoover & Harder, 2015, p180). In this case, whilst the *Sustainability Champion* has certainly put in the time and has the energy and personal commitment, I question the extent to which the supportive environment is evident, when the senior member of staff responsible for the curriculum is unaware of an external sustainability research project and, indeed, seems largely ignorant of the wider activities of the *Sustainability Champion* herself. Hoover and Harder (2015) also note that ‘a final characteristic of individuals who seek to drive institutional change is a positive view of sustainability and this positive approach is linked to patience and the ability to see positive change even if it is slow, or the possibility of it ever happening’ (p 181). Without the sustainability vision and patience of the *Sustainability Champion* at this



college, I am fairly confident that the progress made to date to embed ESD in the Hairdressing curriculum would not be as advanced as it is. The key failing here may lie in the area of communication. ESD as a transformational vision of social and economic change is commonly predicated upon a congruent systems alignment within the institutions and agencies responsible for its active promotion and dissemination. In other words, ESD promoting institutions must have within them sustainable communications ecologies routed in core democratic values of participation, consultation, 360-degree assessment and good citizenship. What we may be seeing here is significant discontinuity in this ecology routed in prevailing hierarchies and linear decision making.

A study by Shiel *et al.* (2016) established that with projects where universities play a role in establishing sustainable communities, ‘even where projects seem more substantial and are specifically related to sustainable development, evaluative measures are in the formative stages of development’ (p54). Furthermore, ‘there is very little evidence that such activities are fully captured or centrally coordinated; they are unlikely to be systematically evaluated’ (Shiel *et al.*, 2016, p54). This could explain why the senior member of staff at this college was unaware of the substantial progression of ESD in the Hairdressing Department as the project was coordinated locally within the department and evaluated externally. It remains nonetheless an ominous finding.

### Case Study 3 - College C

The research process at College C was twofold. As this is the college where I am employed, I was in a position to work directly with the class of students and their teacher, on a weekly basis. First, the research took place with Access to Care Students (Intermediate 1 Level), using the *Introduction to Sustainability Workbook* which has been adapted into an online learning resource as a Moodle course. Secondly, I surveyed students during Orientation Week to gain a general feel of their sustainability ethos. As in the two previous Case Studies, I also worked with a *Sustainability Champion* with whom I already had an established relationship as a result of my role within the college as the Sustainable Development Adviser.

There were 13 students in the class when the research began and 12 consented to take part. The student who declined to take part in the research before completing the course, changed their mind and consented to taking part after the course was finished. The results from the Care students completing the questionnaire before and after completing the Introduction to Sustainability Course follow.

**Q1. What does sustainable development or education for sustainable development mean to you? (leave blank if you are unsure)**

**Table 6.13 – Student Opinions of Sustainability and ESD (3) – Pre and Post-Intervention**

<b>BEFORE (12 surveyed, 2 responses)</b>	<b>AFTER (7 surveyed, 5 responses)</b>
Working together to make sure the earth can sustain human life.	It has shown me a new way of learning
The process by which we learn to work with the environment in a way that resources will not be exhausted.	Learning about the environment
	It is a new way of learning
	It means not using more power than you need to, to help make the planet better
	It means to learn about how the environment works and what we can do to fix it

Only 2 students chose to give an answer to this question before the research period. The 2 students who provided answers before the research began left college a few weeks later and neither took part in the research after this or completed the questionnaire after the Introduction to Sustainability Course was completed. The responses provided after were from students who did not provide an answer to this question pre-intervention.

### **Focus Group / Semi-Structured Interviews**

During the time I worked with this class, we discussed sustainability and the work we were doing together. These discussions were recorded and were meant to be focus groups, however this group of students did not respond well to the formality of a focus group. As a result of this I ended up being far more involved in the discussions than I had initially meant to be. This meant the discussions were closer to being group semi-structured interviews than focus groups. The size of the groups ranged from 8 to 12 students.

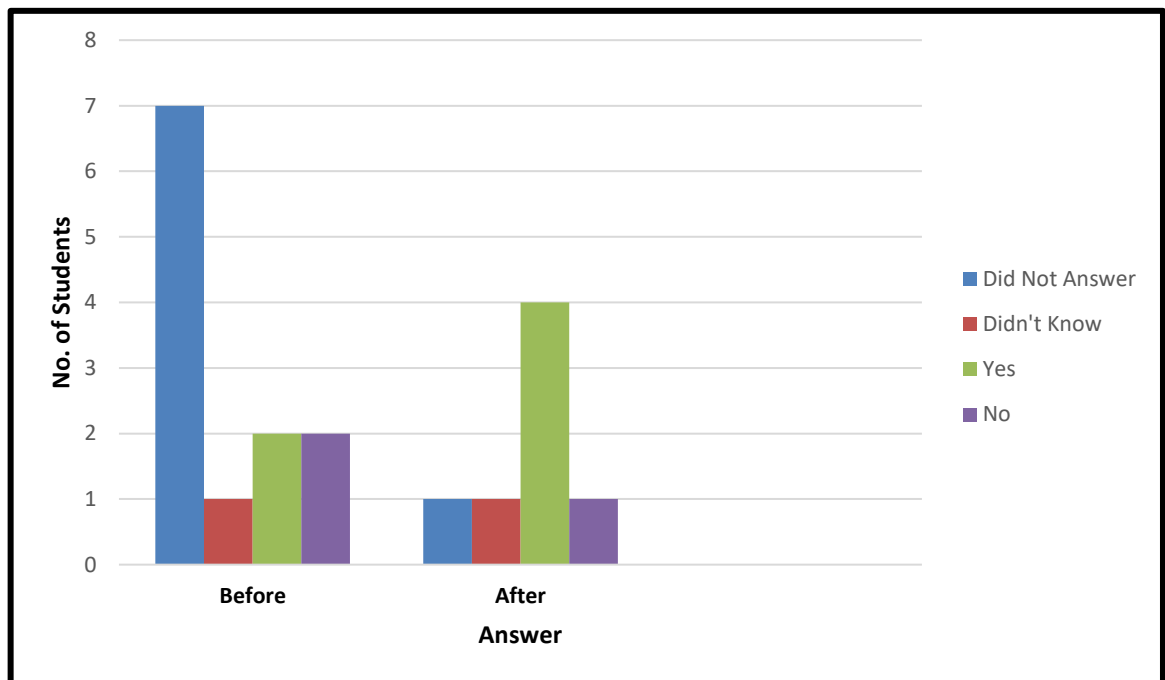
When discussing the workbook, the students were always positive, there were comments such as ‘I found it quite interesting’ and ‘I never thought there was so much damage to the environment’. Furthermore, when asked about chapters in the workbook and activities we had done that were not directly related to their course, did they still think they were useful? – the students were all in agreement that they thought all chapters were relevant because ‘we still need to know this at the end of the day, by living like this we are causing problems for the environment and people need to be told about this’.

The students further expanded upon the comments that ‘people need to be told’ and all agreed that all students need to learn about sustainability and it was important because ‘we can go and show other folk what we have learnt’ and ‘we can help share the information, we can tell those we care for how the environment and our health are linked’. There were also comments about students in other curriculum areas such as ‘yes they need to know because they are all using materials, even if it is only paper, so they need to know about the life cycle of things’.

This is evidence that the students were starting to make connections, not only between their course and sustainability, but also about how we use materials in our work and personal lives and the impact this has upon the environment also.

**Q2. Do you think sustainable development should be included in your course?**

(Before: 12 surveyed, 12 responses: - After: 7 surveyed, 7 responses)



**Figure 6.3 – Should Sustainable Development Be Included in your Course (3)**

Prior to the research taking place and the completion of the course, most students declined to answer this question. Although the number of students had reduced by the end of the course, all apart from one were now willing to provide an answer to the question. However, *Figure 6.3* only provides part of the picture because when asked during discussion their opinion about all student being taught about sustainability their comments were far more revealing. As has previously been documented responses such as ‘we still need to know this at the end of the day, by living like this we are causing problems for the environment and people need to be told about this’ and ‘we can go and show other folk what we have learnt’ demonstrates the level of importance they have placed upon this.

**Q3. In what areas of your course do you think sustainable development would best fit? (leave blank if you are unsure)**

**BEFORE** the research and completion of the course, not one student left an answer to this question. (12 surveyed, 0 responses)

However, afterwards some of the students did provide responses.

***Table 6.14 – Sustainable Development Best Fit (3) – Post-Intervention***

<b>Responses Received AFTER from Students (7 surveyed, 4 responses)</b>
All
All students should learn about sustainability
All students should learn about sustainability
Making people aware of the damages to health and illnesses pollution causes

The written answers provided by the students in *Table 6.14* are examples of how these students did not always respond well to being asked questions in a formal manner. As demonstrated earlier when I sat and discussed sustainability in a more informal manner with the students they really opened up and gave much more in depth answers. For example, the written answers in *Table 6.14* that ‘all students should learn about sustainability’ is not nearly as detailed as ‘we still need to know this at the end of the day, by living like this we are causing problems for the environment and people need to be told about this’ and ‘we can go and show other folk what we have learnt’, ‘we can help share the information, we can tell those we care for how the environment and our health are linked’.

**Q4. What have you been taught about sustainable development in your course already?**

Again, BEFORE the research and completion of the course, not one student left an answer to this question. (12 surveyed, 0 responses)

However, afterwards some of the students did provide responses.

**Table 6.15 - Previous Sustainable Development Teaching (3) – Post-Intervention**

<b>Responses Received AFTER from Students (7 surveyed, 5 responses)</b>
About the 3 circles of sustainability and the amount of resources needed to make products such as furniture and mobile phones. We need to have more recycling in these processes.
We have been taught how to use things in the right way.
Everything about sustainability. I liked it.
We have been taught about how much electricity is used when things are on standby. We have also been taught how to calculate our carbon footprint.
How much energy certain electrical equipment uses and how to do the carbon footprint.

A major point for consideration here is not the comments made by the students but the fact that before completing the *Introduction to Sustainability Course* in nearly 100% of cases, the students declined to provide an answer. However, after completion of the Course, and working with myself as well as their class teacher, they were far more willing to engage. This emphasises either the importance of utilising an ESD Practitioner, or further reinforces the point made earlier that sustainable development can be brought to a point where it is now no longer considered by the students to be ‘outside of their comfort zones and therefore perceived as too risky since it did not build on existing knowledge’ (McCoshan & Martin, 2014, p11).

Again, although students were more willing to engage in the post-intervention questionnaire than the pre-intervention questionnaire, they were still more willing to engage and provide more detailed information when it was discussed informally.

### Focus Group / Semi-Structured Interviews

In *Table 6.15* the students mentioned electricity and energy use and carbon footprints, however when we discussed this question their answers showed much more sophisticated understanding. For example, comments included ‘I can’t believe how many planets would be needed if everyone in the world had a carbon footprint as big as mine’ and ‘I really should buy less stuff, not just to save money, but because I know how much now I am damaging the environment’.

These excerpts go some way towards demonstrating a deeper level of understanding which is not reflected in the student’s written answers but that they were however definitely happy to discuss.

Table 6.16 provides the answers to Questions 5 – 9 post-interventions only. This is because only two students provided answers pre-intervention, one was ‘no’ and the other was ‘don’t know’.

**Table 6.16 - Further Sustainability Questions (3) – Post-Intervention**

Questions 5 – 9 – Post-Intervention (7 surveyed, 7 responses)	Yes	No	Don’t Know
Q5. Have you heard of the United Nations Decade of Education for Sustainable Development?	2	4	1
Q6. Does the Scottish Government have a policy on education for sustainable development in Scottish college education?	3	2	2
Q7. Have you heard of or had contact with the Environmental Association for Universities and Colleges?	1	3	3
Q8. Have you heard of or had contact with People and Planet?	1	6	
Q9. Does your college have a policy on sustainable development or sustainability?	2		5

The data shown above appears to suggest that the *Workbook* interventions have not had anything other than a modest impact on student learning in relation to the broader largescale conceptual understanding of the national and international agendas. Although the *Workbook* itself does not actively engage with these agenda explicitly, these questions were asked to determine if having greater engagement with ESD, meant students were

more likely to become aware of the broader agenda surrounding ESD. It is important to note that the *Workbook* tool was deliberately designed to support a curriculum driven and curriculum focused model of learning, certainly it was hoped, on the basis of the express mission of these colleges, that curricular understating in specific disciplinary and vocational areas would stimulate an appetite for knowledge and understating of the broader and international context. That this does not seem to have occurred on any significant scale suggests the curriculum alone, even in an enriched setting like this one, cannot support major growth in conceptual and ethical awareness and other aspirations for the ESD cause. Nevertheless, with the benefit of my own total immersion in my own workplace I was able to document broader elements of student progress in relation to incremental ownership of the ESD agenda in its individual and collective forms. This can be evidenced by:

- The students chose to undertake the John Muir Award linking a wild place with the impacts of climate change and asked if I would help them with this.
- The students chose to volunteer for the British Heart Foundation as they were concerned about health problems linked to environmental issues. As a result, they raised nearly £800.00 for the British Heart Foundation.
- The *Introduction to Sustainability Course* was credit rated by the college as an awarding body through the Scottish Credit and Qualifications Framework and the students who completed the course were awarded this qualification.
- The project with this group was short-listed for a Green Gown Awards by the EAUC. I also attended the EAUC Scotland Conference, along with some of the students and their Personal Tutor, to present the sustainability work we had done.

Although, these initiatives cannot be compared against the case studies at College A and College B, because I did not undertake such interventions at those colleges, and if I had they may have achieved the same results. The class (along with their Personal Tutor, who was the Sustainability Champion) asked me to work on these projects with them, which is indicative of what can be achieved when a Sustainability Champion and ESD Practitioner combine forces. This experience argues for a base up model of student learning complimented by a direct instruction model enabling the students to connect meaningfully their day to day experience with the major issues that are posed by ESD. In this case having an expert mentor to work with the Sustainability Champion does appear to have



produced results to a greater extent. However, this intervention was very different to the other two so a direct comparison cannot be made.

#### **Focus Group / Semi-Structured Interviews**

All of the students were in agreement that the chapters they liked the most in the workbook were the chapters on carbon footprints and water consumption.

Although the written answers provided indicated that there was little change in student's perceptions of largescale conceptual understanding of the national and international agendas, greater engagement with ESD, meant students definitely had greater understanding of their own impact upon the planet due to their actions.

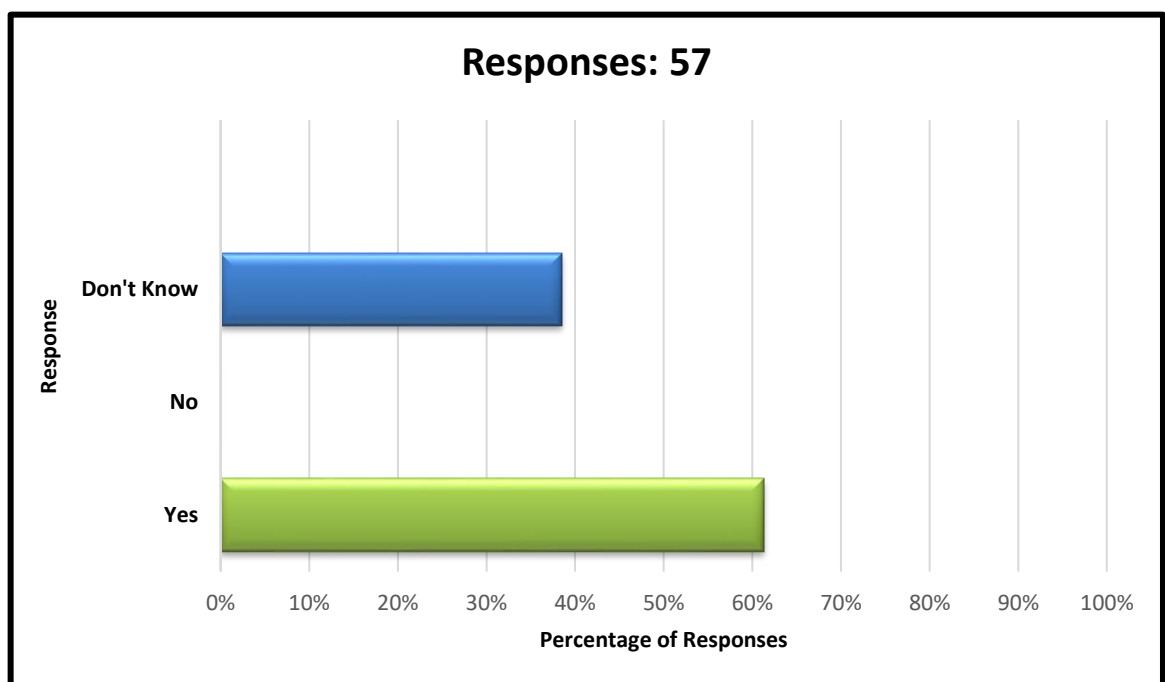
#### **Focus Group / Semi-Structured Interviews**

After the students had completed the post-intervention questionnaire, it became evident that the informal focus group discussions I had with them were far more valuable in determining any mind shift in their sustainability values. This was indicated by comments such as 'some of this I am actually doing at home as well, well sometimes, when I remember' and 'I've started doing it too, switching things off, not leaving them on standby' when discussing electricity use. There were also lots of interesting comments when we discussed water conservation because most of the students (5 out of 8) advised they did not know why there was a dual flush button on the toilets in the college. When this was discussed again at a later date, one student answered 'I still just push both buttons' however the rest of the students remonstrated with one even commenting 'it's not hard, just push the wee button, unless you really need to push the big one'. Comments such as this and 'in Scotland we don't think about our water because it is not metered like it is in England', validate students were definitely giving more thought to water conservation.

### Generic Sustainability Student Survey – College C

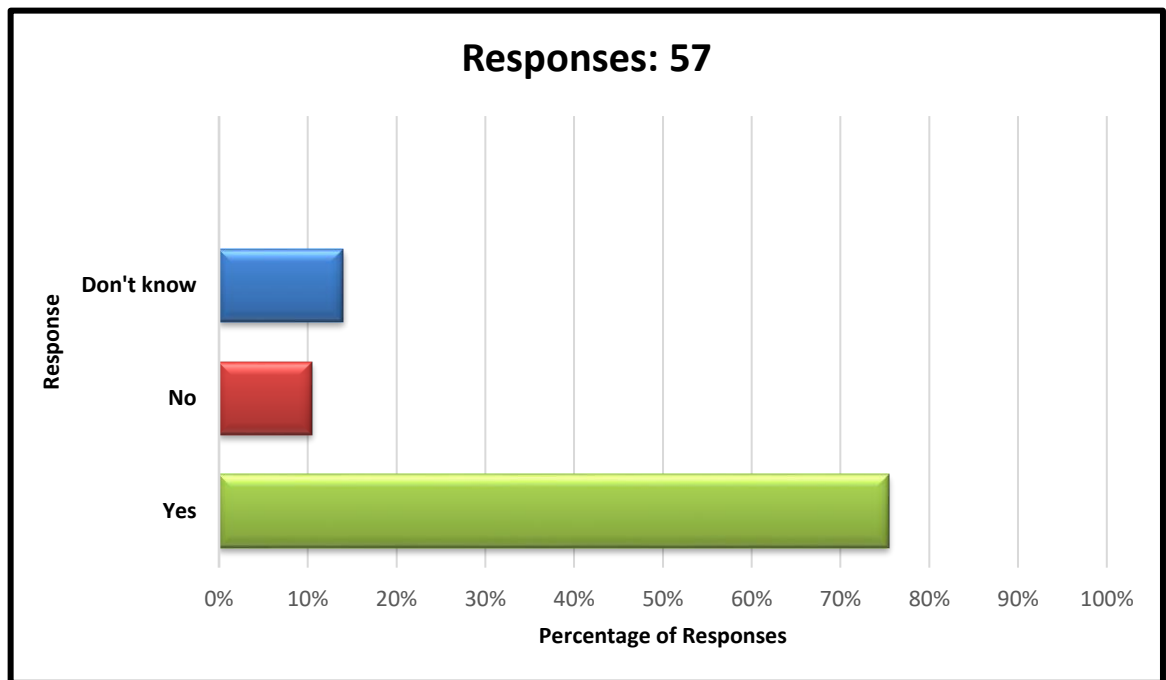
This short student survey, consisting of six questions, was conducted during ‘orientation week’ at the start of the academic year, with assistance from the Student Association Executive. The rationale for this was a further determination on my part as an embedded participant-practitioner researcher to test the credibility of my own position and of the accumulated learning of the student body. What this would enable me as a researcher to ascertain, is the prior effects of sustainability work at the institution within which I was working, and which had something of a reputation of being committed to these points. It provided another instrument to triangulate the data from my own home institution. I am conscious this was not conducted at the other colleges, as this was not an option there, but was allowed here as a measure of the success of the colleges sustainability ethos.

#### Q1. Do you think sustainable development should be included in your course?

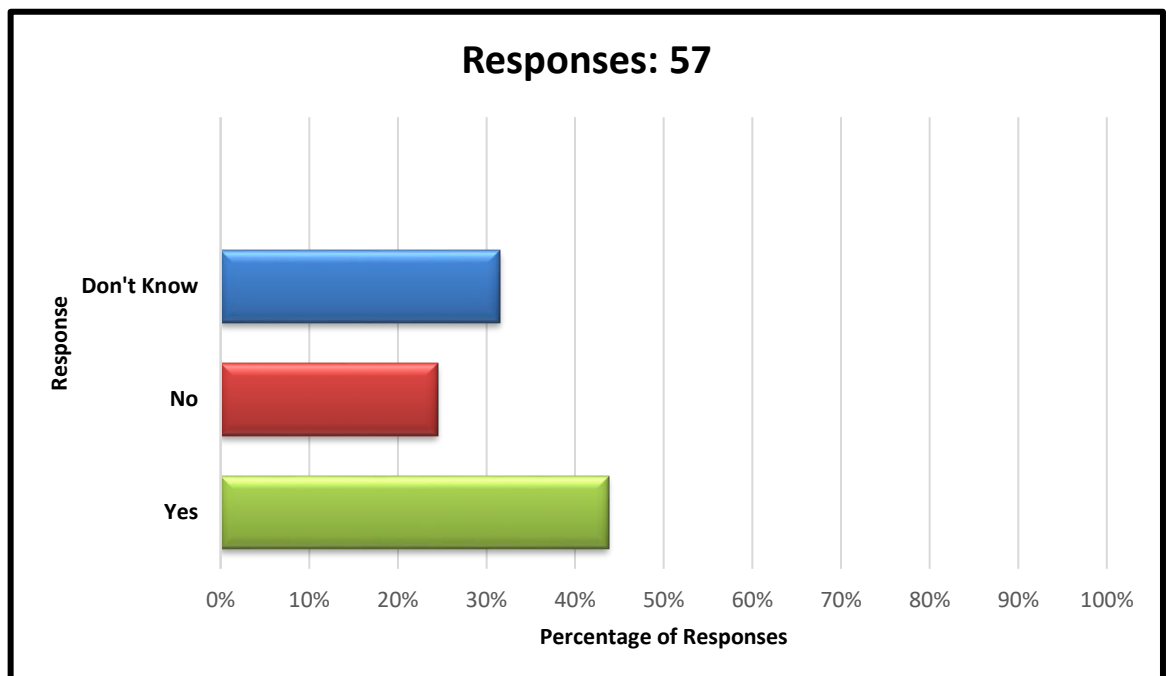


**Figure 6.4 - Should Sustainable Development Be Included in your Course (4)**

The majority of respondents, over 60%, thought that sustainable development should be included within their course. However, nearly 40% of respondents were unsure if they should have sustainable development included within their course. Encouragingly, nobody responded that they thought sustainable development should not be included in their course.

**Q2. Are you aware of man-made climate change?**

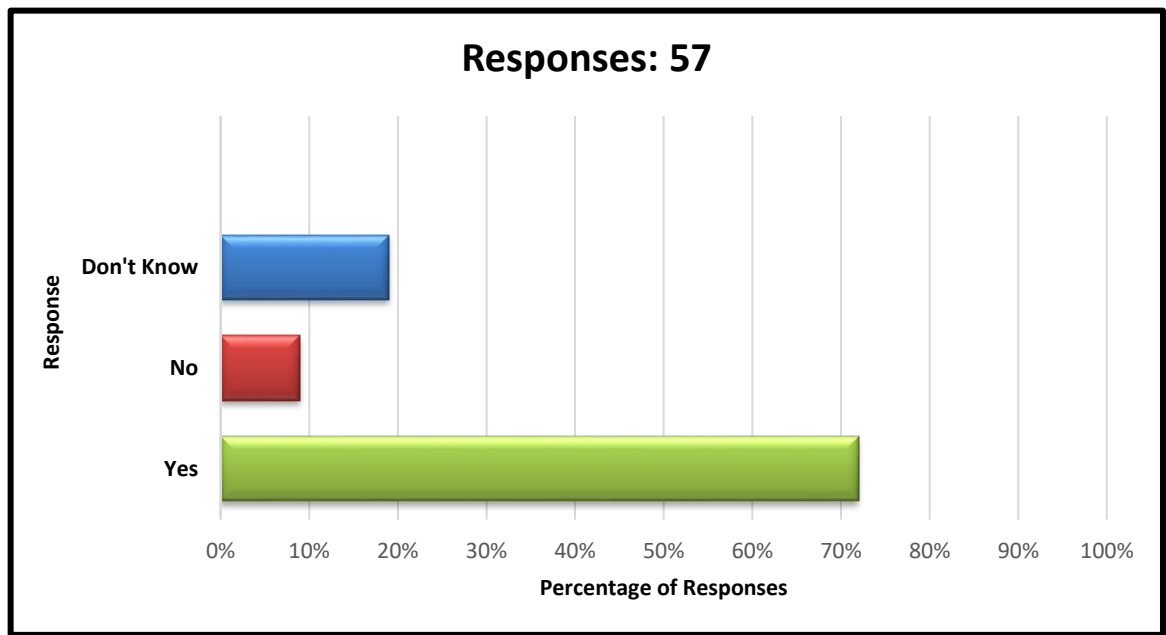
*Figure 6.5 – Awareness of man-made Climate Change*

**Q3. Are you concerned about environmental issues?**

*Figure 6.6 – Concern about Environmental Issues*

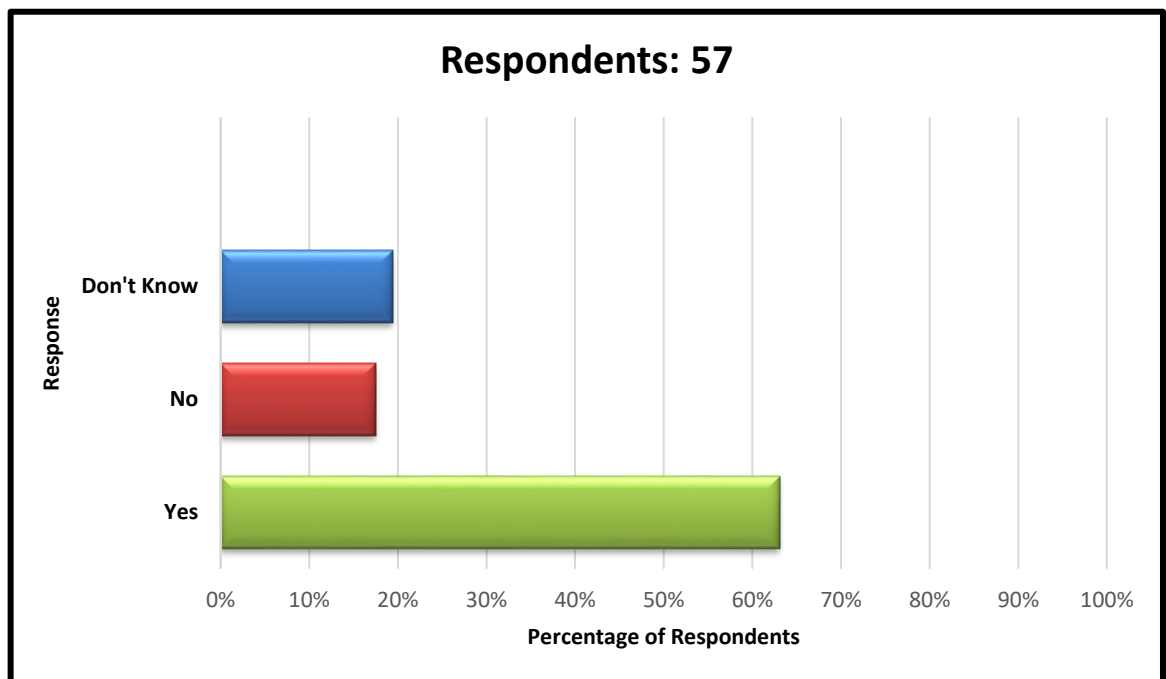
Figure 6.5 advises the majority of students, over 76%, are aware of man-made climate change. Also, over 40% (Figure 6.6), are concerned about environmental issues.

**Q4. Do you think you should be taught about environmental issues at college?**



*Figure 6.7 – Teaching about Environmental Issues*

**Q5. Do you use any energy saving technologies?**

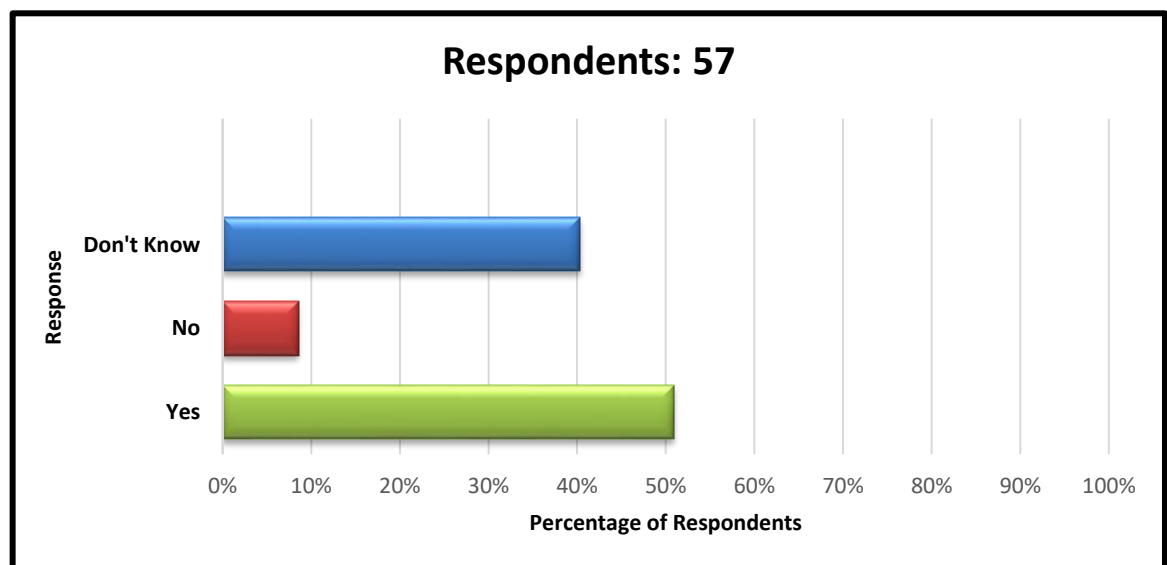


*Figure 6.8 – Energy Saving Technologies*

All of the students who advised they did use energy saving technologies, apart from two, mentioned energy saving or low energy light bulbs. The other two respondents who also answered yes, but did not mention energy saving light bulbs, both advised they used solar panels. However, providing information about energy efficiencies may not necessarily

translate into positive changes. Cotton *et al.* (2015) conducted research at Plymouth University which has strong commitments to sustainability but they still discovered significant gaps in those surveyed of their knowledge of energy issues, suggesting that this is an area that is not being effectively communicated through formal educational channels. This in turn suggests that greater efforts are needed to link formal learning with daily life to enhance awareness of how individuals use energy in everyday practice and illustrate how changing behaviours affect energy use (Hardy 2013). One example of how this might be promoted is through combining educational initiatives with more lifestyle-related interventions, such as the provision of household appliances or the creation of social media platforms which encourage recognition and reflection on energy consumption behaviours (Bouzarovski, 2014) and discourage particular choices or habits, such as overfilling kettles for example. Although these studies are embryonic and so far relatively small scale there are indicators within them which corroborate the wider findings of this research: that transformational change of the scale required to realise the ambitions of ESD in educational institutions is dependent upon the habits of the institution where knowledge, learning, behaviour, aspiration all integrate around a collective community vision of ESD.

**Q6. Do you think the college has a policy on sustainable development, sustainability or environmental awareness?**



**Figure 6.9 – Awareness of College Sustainability Policies**

Despite the many positive indicators around this college the percentage of ‘don’t knows’ to this question is alarming and once again suggests weaknesses in the communications continuum from strategic policy to learning and teaching. In this instance there is

abundant evidence of student engagement with the core questions and ideas but much less confidence in the student appreciation of institutional strategy

### **Analysis and Discussion of Results: Context**

Each case study had its own challenges and failures in terms of implementation and access to research findings. At College A, a successful relationship which was central to the research was compromised when the Sustainability Champion left the college. This meant that there are no research data of student opinions of student perspective from the period following the use of the *Hairdressing Heroes Workbook*. There is however, some data from staff pertaining to the methodological approaches to help teaching staff to overcome some of the barriers to embedding ESD in the curriculum. At College B there is limited data as a result of the small class size who took part in the research process. However, there has been success in the strong relationship which continues with this college, with positive informal feedback from staff and continued use of the existing, and new ESD learning and teaching materials. College C has seen very particular, specific and ongoing challenges, largely because ESD is perceived to be successfully embedded in the curriculum and so the task is now regarded as complete with no further work required. This will be discussed in more detail later. However, on a positive note at College C, other developments have been implemented such as the incorporation of ESD into the college's Climate Change Action Plan. This is a very recent initiative, but it does provide scope for future engagement with ESD.

### **Curriculum Development of ESD in Scottish Further Education**

Curriculum development in Scotland has indeed strengthened over the last decade with the introduction of *Curriculum for Excellence* and the progression of Education for Citizenship. A forward thinking curriculum certainly impacts upon the calibre of the workforce it produces, and learning for sustainability needs to be recognised as the next major goal to be achieved for tomorrow's employees to improve their skills and help strengthen Scotland's economic productivity. 'Continuing development of Scotland's labour force in terms of skills and potential productivity is critical to continuing and growing competitiveness and hence wider economic success. FE colleges clearly have a major role to play in this context' (David Hume Institute, 2012, foreword). Furthermore, students not only *need* sustainability skills but as this research has established, the majority also *want* these skills and believe they should be provided with them (Figures 6.2, 6.4 and 6.7). The David Hume Institute (2012) also reported that 'the strengths of Scotland's

human capital reflect the strength of our education and training institutions and also the policies of successive governments' (p1). However, as established in earlier chapters, policies concerning learning for sustainability still have much room for improvement in Scottish FE. It is becoming increasingly clearer that these policies are oftentimes not being translated into practice by senior management within colleges, but are more likely to be practised by those on the ground. Hence, the real push for learning for sustainability oftentimes is by dedicated ESD champions, both staff and students, or by Student Associations who are engaged with projects and organisations such as the NUS Responsible Futures Programme.

Furthermore, and perhaps even more worrying, the David Hume Institute (2012) determined:

In other nations, the assumption is that vocational qualifications, especially those being offered to young entrants to the labour market, must be able to provide a platform of wider learning that helps bolster occupationally specific knowledge, allows the individual to participate as a worker and a citizen, and helps support lifelong learning. This is not the case in the UK' (p35).

ESD is an important tool for wider learning and can play an important role in citizenship learning and teaching, as well as improving employability when related to specific occupational knowledge. Therefore, successful ESD at all levels of Scottish college education ought to be able to ensure that young entrants to the UK labour market, with vocational qualifications, are comprehensively trained and aware, not only in their chosen career, but also to be an effective global citizen in what will be a challenging future.

One method of changing further, beyond linking ESD to employability, may be to recognise ESD as a 'core skill', which is just as important as any other core skill such as numeracy, literacy and IT. ESD as a core skill in FE could be implemented in a similar manner as many universities who are now using 'graduate attributes' as a tool for curriculum redesign to attain whole institution change, including not only the curriculum, but also as an institutional vision and for the wider student learning experience (Luna, *et al.*, 2012, p6). Elevating ESD in relation to core skills may address some of the significant gaps in recognition identified in the case studies, each of which is affected by a deficiency in priority understanding of ESD and its curricular and vocational implications. Core skills learning and teaching further developed in Scottish FE at the turn of the millennium after

employers realised that colleges were producing students who were well trained in their vocations, such as hairdressers and plumbers, but who were less well developed in key transferable competencies for a mobile and unpredictable labour market. Much work has been undertaken in colleges to overcome this problem, so that students are well rounded in all aspects of their employment, and also possess the necessary core skills to make them successful and resourceful beginning employees. It therefore seems clear that the practical and discursive relocation of ESD to the core skills inventory would raise its educational profile without prejudice to its curricular expression, while recognising that it is not merely another idea to be shoe-horned into an already crowded timetable. Hence, my own materials use numeracy, literacy, IT skills and teamwork, where possible, and at the same time link sustainability specifically into working and vocational practices.

Whilst it can be acknowledged that ESD progression in Scottish FE is happening, and oftentimes uses the approaches I am endorsing, the fault lines in the case studies suggest this may still not be enough. UNESCO (2013) is concerned that although ‘there is much to celebrate in terms of activity levels in developing initiatives and projects under the banner of ESD, much of this is through relatively small initiatives and shifts in policy’ and ‘modest incrementalism may be too little too late to reform our economy and society towards a sustainable and climate-resilient future’ (p21). This insight does apply forcefully to the situation in Scottish FE, where the case studies strongly indicate there are pockets of ESD good practice being undertaken in individual colleges, both at the policy and curriculum levels, but where there remains still a long way to go before best practice is found at every college. Moreover, ‘although networks and embryonic communities of practice exist, these tend to be within sectors’ (UNESCO, 2013, p21), and some sectors are stronger than others. The case studies certainly seem to show that, while there is evidence of ‘networks and embryonic practices’ within Scottish FE, these networks are not as well established as those in others sectors of Scottish education, such as primary and higher education. Much more is still required to make the transition necessary for life in the future. A hallmark of the case studies is fragmentation, in terms of both student learning and institutional practice.

To meet the challenges of life on a planet with an increasing temperature, rising population and resource depletion, serious changes are required. Lonsdale *et al.*, (2015) question if society is capable of the ‘big change’ that is required in meeting the risks associated with climate change, for example. This is because a ‘big change threatens our sense of stability; a steady change from business as usual may be far more palatable than change which may



require us to question what we value and the way we live' (Lonsdale *et al.*, 2015, p6). Furthermore, full-blown ESD also questions our moral norms, and we need to be careful in ESD teaching that the ethical importance of the challenge ahead is conveyed – though this needs to be done in an unthreatening and tactful manner consistent with the central values of democratic learning. At the same time, it needs to be prompt and urgent. The idea of transformative change and a move away from incremental shifts, to secure a sustainable future has been adopted by the Intergovernmental Panel on Climate Change (IPCC, 2014) in their *Fifth Assessment Report*. This may require a 'paradigm shift' (Kuhn, 1962), not only in societal thinking about the way we live, but also as indicated by Sterling (2013) in our educational systems. A notable omission in the case study data is morality. Colleges are understandably hesitant in imposing values and dogmas on their students. But if the aims of ESD are articulated and examined in moral terms then students are much more likely to engage with them in a much more fundamental, existential sense. This applies whether they actively subscribe to ESD or proceed to view it sceptically.

Within this ethical discourse, the notion of transformation in relation to environmental adaptation is increasingly prominent – though it too often remains a vague concept that is difficult to define (Mustelin & Handmer, 2013). At its heart, adaptation is the radical reorientation of our lifestyles to respond to and flourish within a changing planet. Transformation is the pedagogical and moral driver through which successful adaptation is to be achieved. As noted by O'Brien (2012), however, adaptation, just like sustainability, means different things to different people or groups, and it is not always clear *what* exactly needs to be transformed or why. If 'transformational learning' is required and its meaning is uncertain, then we are back to the problem of definition, in a similar way that it is difficult to define sustainable development and ESD, as explained in Chapter One. As the case studies show, the pervasive definitional difficulty does not aid colleges in developing approaches for transformational learning to achieve that other equally difficult concept to define, sustainable development. If different colleges define transformational learning differently, there is the possibility that different approaches will be taken across Scottish FE. Do we allow this to happen naturally and organically, or should stakeholders and governing authorities intervene to ensure there is uniformity across the board? To achieve uniformity there needs to be agreed guidance across the entire FE educational spectrum. But is uniformity the best approach, since, it could be argued that there is no 'one size fits all' for ESD learning and teaching. There is a paradox here to be unpicked in the data, from one vantage point the data seems to suggest the need for firm centralised and even prescriptive leadership mandating the institutions to implement a convincing programme of

ESD learning across all campuses. From another, the data in its wide variation suggests the advantages of local, customised solutions tailored to regional, social and economic need. Maybe the approach to ESD needs to be as variable as its audience in order to ensure it meets the requirements of multiple communities, who have diverse needs. However, ‘a common complaint of Colleges is that Government does not make it clear to the sector what is expected of it’ (Scottish Government, 2012, p20), underlining the data indicator that the variations in college performance may themselves be another obstacle for colleges choosing to engage with ESD.

As previously indicated research in the FE sector is largely lacking, however some lessons may be learned from an important observation made in HE. Research in HE acknowledges that employers have shown scepticism towards a system insufficiently flexible to develop the degree programmes and graduate attributes required for a major shift to the green economy (Luna, *et al.*, 2012). Furthermore, Luna *et al.*, (2012) states that ‘for anyone interested in promoting sustainability and a green economy, such curriculum redesign seems essential’ (p18). However, the system as currently constituted has no formal processes in universities, many of which would form significant part of the curriculum reform (Luna *et al.*, 2012, p8). There is abundant reason to believe that similar limitations afflict FE and this may be coming through in the case study data. Care needs to be taken though because UK economic policy often links environmental education to the ‘green economy’, so often policy is more concerned with the economic strand of sustainable development rather than a true integration of the economy with the environment and society (Luna *et al.*, 2012).

Not only is it an issue that various forms of ESD that take place both formally and informally in colleges are not accredited, and therefore not officially recognised, it is also a serious problem for employers that university level courses based around ESD are also frequently not professionally rated and recognised. If this work is not properly accredited then there is potentially no quality assurance of its assessment, or even no proper multidisciplinary assessment system itself. These absences reinforce the mistaken impression that ESD is an optional supplement to student learning rather than a core component. This shortcoming could be overcome by instigating formal requirements for ESD assessment which would help assuage employers’ fears and persuade students of the contribution effective ESD is making to their learning and qualification. Eilam and Trop (2010) believe that ‘it is the lack of clear guidelines regarding ESD pedagogy that contributes to the lag between practice and rhetoric leading to not only problems of

implementation but also difficulties concerning effective evaluation, which is essential for advancement in the field' (p57). Therefore, guidelines are required and a means of effective evaluation, this could start to be achieved by the Scottish Qualification Authority ensuring ESD has to be built into all assessments.

### **Staff Development**

As reported by Taylor (2013) 'sustainability in universities needs, itself, to be sustainable' (Chapter 12). In order to remain sustainable, there is clearly a need for training and education to be provided to staff on an ongoing basis, or there needs to be the same professional standards for college lecturers, as the General Teaching Council demands for school teachers, for sustainability training. An absence of such provision is surely felt throughout the case study data: responsibility is damagingly off-loaded; shared understanding and ownership is minimal; coherent philosophies of learning, teaching, training and assessment often do not exist. All staff appear to be in urgent need of a fundamental upskilling in their understanding of ESD and its multiple implications for the nation. Taylor (2013) underlines the irony here by arguing that 'it could be expected that higher education institutions would show leadership by becoming exemplars of sustainability through their teaching and research, their operations and their community interactions' (Chapter 12). I would further argue the situation should be the same in colleges also. This reinforces the view that 'formal educators need to make certain that students and the broader public are aware of our urgent sustainability challenges and have the skills and information to participate in solutions' (Rowe *et al.*, 2015, p118). Research by McKeown (2002) recognised, for example that teacher education programmes need to train professionals in an interdisciplinary manner in order to provide a holistic understanding of a sustainable future and the role of individuals, communities and nations in a sustainable world. The problems revealed in the case studies show very clearly that the college sector is as a whole falling very short of these ideals and expectations.

A meta-ethnographic synthesis of peer reviewed case studies conducted by Hoover and Harder (2015) established that effective staff delivery of sustainability was linked to 'the importance of 'walking the walk', directly or indirectly, sometimes reflecting on the difficulties of doing so in their current work' (p181). This presses home the importance of the ethical stance assumed by of 'sustainability champions', who commonly want to conduct their work with an integrity which is also echoed in their wider personal-professional lives. Effective interdisciplinary and holistic sustainability training for staff

may be the key to linking ESD teaching and an understanding of their lifestyles in the mind-sets of teachers.

Most formal education is disciplinary in nature which is problematic for ESD as it needs to be interdisciplinary to be effective. The disciplinary siloing of knowledge in the standard FE curriculum may be one of the reasons we see ESD falling between the cracks in whole or in part in some of the data from the case studies. Almost 25 years ago, a ‘holistic view’ of education was largely adopted by UNCED (1992) in Agenda 21, which provided a systemic way of combining education *with* sustainable development. However, a potential problem with interdisciplinary learning is that no-one in an institution takes responsibility, so very much like the problem of ‘the commons’ there is no ownership so it is not developed, or thought important. This makes it the responsibility of someone else, which seemed to be the case with Chapter 36 of Agenda 21 (the main education chapter), which received virtually no comment during its passage through the UN system, as it appeared only to be a ‘worthy cause for other people to take up’ (Smyth, 2006, p251). This difficult insight underscores another element in the data; the importance, and sometimes absence, of curricular and strategic leadership in ensuring the proper and full blooded ownership of ESD within the colleges.

### **Opportunities for Student ESD Development**

Important research in Australia found that ‘clearly, ... a number of opportunities can be explored as mechanisms for furthering sustainability education. One of the most important leverage points is evidenced by students themselves and by their demonstrated interest in sustainability efforts on campuses nationwide’ (AASHE, 2010 p3). My results echo these sentiments in relation to Scottish FE, which is evident in Figures 6.4 and 6.7. This is because ‘where colleges and universities may have the largest impact, ... is with the students they educate’ (AASHE, p8).

It has been established (Lipscombe, 2008) that oftentimes universities do really well in ESD in many extra-curricular areas or cross-curricular activities, and from my own experience in FE I can confirm this is the case. I have always worked closely with the Student Association and together we have implemented many interventions in community engagement, volunteering and fundraising. As established in Case Study C, the learning and teaching materials did not bring about the change in student knowledge of the bigger ESD agenda, however they provided the catalyst for engaging with a difficult to reach

group who then took their learning out of the classroom. They made visible what they had been taught by linking health concerns with environmental issues and as a result did many fundraising events for the British Heart Foundation. At the same time, they highlighted climate change and how it would affect their careers as carers and promoted local, seasonal produce and healthy eating, across the college campus whilst they were fundraising. Before working on the Introduction to Sustainability Course, they may not have recognised this as ESD.

Formal ESD learning and teaching materials are an important start, but as the case studies have shown they are not enough on their own. Just as Lipscombe (2008) established in HE, ESD may be easier to implement in the informal curriculum as development in the formal curriculum may be more challenging. Whilst I acknowledge the informal curriculum is a vitally important weapon in the ESD journey that must not be overlooked, I believe ESD will be at its most powerful when formal ESD learning is taken outside the classroom and made visible to all. However, it is not merely enough that the students willingly engage in these activities, as the case studies have made clear, they must also be taught that what they are doing is ESD and vital for future sustainability. Also, successful campus sustainability initiatives should be supported and celebrated as this helps to communicate sustainability achievements to the wider campus community (Brinkhurst, *et al.*, 2011). Barth *et al.*, (2007) recognise that combining formal and informal learning settings can help further the development of ESD competencies in HE, and I would argue the same applies to FE.

Informal student learning has been hampered in Scottish FE over the last few years because of timetabling changes. Just as funding cuts impact course provision, they also change learning delivery. In the 9 years I have worked in FE I have witnessed significant timetable changes for students. When I began working in FE, most full-time students attended college 4 or 5 days a week, with periods of directed or self-study, which provided their course work was complete, could be used for informal learning and engaging with the Student Association. In fact, this is where I first began implementing many citizenship and community engagement projects, before I recognised the need to make this cross campus work formal within the curriculum as ESD. However, because of funding cuts, full-time students are now only normally at college 2 or 3 days a week and these days are full of classroom learning from beginning to end. As they now have 2 or 3 days where they are not in college, they are likely to look for part-time jobs. The directed study sessions have been majorly reduced, and therefore when students are at college, as they are in class, the

ability to spend time doing the informal ESD activities, which was an important tool for engaging not only with the students doing the activities, but with the other students who would come and engage also, has been removed.

A lot of the problem lies in understanding what the environment means because to ‘many people, the government and the public, the environment continues to be essentially ‘green’ (Smyth, 2006, p248). This is no different with college staff and students, however the informal curriculum can help overcome this. The citizenship schemes, community engagement work, volunteering and fundraising ventures, need to be communicated to the students as ESD activities, as initiatives that make them future thinking global citizens, as socially aware individuals. Therefore, it is important that ESD is implicit in its definition of what the ‘environment’ entails and that students are clear it is not only the ‘green stuff’ we see out of the window. This is already being achieved in primary schools, ‘when one group of children was asked about the benefits of learning for sustainability, they pointed to themselves and in unison replied, ‘Look at us! We’re the evidence of the benefits!’ (Education Scotland, 2014, p6). This is achievable also in FE. However, more importantly, one of my greatest concerns is that if learning for sustainability is not approached in the same manner in Scotland’s Colleges, then that enthusiasm and passion for learning for sustainability will be lost.

### **Removing Structural Barriers**

The research methodology hoped to overcome some of the barriers that have been discussed throughout the thesis. One such obstacle is the perception of relevance of learning for sustainability to specific curricular areas. Orion (2003) distinguished two distinct learning styles, which he defined as ‘natural learning’ and ‘non-natural learning’ (p58). According to Orion (2003) the dominant academic style of learning is ‘non-natural’ characterised as:

Taking place in a closed space that has no relation to any learnt subject; only rarely includes real life concrete experiences with the subject to be learnt; has no immediate relation between the subject to be learnt and learner’s relevant world (p58).

By using activities that relate to real-life and work related experiences the materials I have developed aim to connect learning for sustainability to the learner’s relevant world. As

Case Study C demonstrated this connection to real life concrete experiences is further strengthened when a connection between classroom learning and real life experience is also made. Furthermore, real-life experiences can be related to student's families because in all of the case studies, there was at least one mention of respondent's children and that was why they believed environmental issues and sustainability were important. Human beings are often inherently selfish, and if something will not affect us, we are less likely to be concerned it. This was evidenced by a comment from one students when asked if they were concerned about environmental issues;

‘a little bit about resources but I’m a bit ignorant as it will not affect my lifetime’.

This is very much an anthropogenic concern, and only in relation to themselves as an individual, however they were not overly concerned as they did not believe this would be an issue in their lifetime. This contrasted with comments received from students that concerned their children. It is easier to think about future generations once we have children ourselves because we can picture the future. Not only do we need to make students more aware of futures thinking, it is also important to stress that environmental issues should not only relate to the scarcity of resources. To do this ‘discourse should also be informed by practitioners and practice in diverse cultural contexts’ (Stevenson, 2006, p287). However, care also needs to be taken to ensure that sustainable development is not viewed ‘as a ‘salvation narrative’ that represents the way for society to be rescued from environmental and social destruction’ (Stevenson, 2006, p287).

The United Nations (2012) declared;

we resolve to promote education for sustainable development and to integrate sustainable development more actively into education beyond the United Nations Decade of Education for Sustainable Development (Par 233).

But was the UNDESD just another project that has now ended without being structurally embedded within education. Ryan and Tilbury (2013) noted when reviewing the achievements that have taken place in HE over the UNDESD, that whilst steps have begun to be taken by many institutions, ESD still remained on the periphery of many degree programmes and in most cases only appealed to those that were already engaged. This will only change when learning for sustainability is embedded within all programmes in HE *and* FE. An objective of ESD is to produce students that are critical and creative thinkers

(Lozano, 2006). Where learning for sustainability is successful, this is happening and is already being observed in Scotland's schools. But as McCoshan and Martin (2014) point out 'there is a lack of yardsticks against which to measure progress' (p3). Until the barriers are removed, this will continue to be the case.



## Chapter Seven: Conclusion

### Chapter Purposes

- To summarise the overall aims and argument in light of the research data generated.
- To highlight the research findings and reflect on their implications for learning for sustainability development, knowledge and practice in Scotland's Colleges.
- To discuss possible solutions highlighted by this research for overcoming the barriers to embedding learning for sustainability in the curriculum.
- To consider the limitations of the research and suggest areas of further research.

### Introduction

It has become increasingly apparent throughout the research process that very little is known about the extent of learning for sustainability across Scotland's Colleges. Little has been documented about the efforts to date to embed learning for sustainability within the curriculum, or the effectiveness of the limited initiatives to date. Policy driven proposals by the Scottish Government are plentiful, and consistently endorse that education for sustainable development (ESD) will ultimately achieve:

The UN's Sustainable Development Goals [which] offer a vision of the world that I believe people in Scotland share.... I am delighted to confirm that Scotland has become one of the first nations on Earth to publically sign up to these goals and provide international leadership on reducing inequality across the globe... We need to grasp the opportunity that following this path offers to create a fairer Scotland and a better world both now and for generations to come.

Nicola Sturgeon, First Minister of Scotland (July 2015)

It has been consistently evidenced, during this research period, that the Scottish Government's desire has not successfully translated into effective practice in Scotland's Colleges. Furthermore, it has also become increasingly apparent that whilst appropriate learning and teaching materials are crucial to aid the progression of embedding sustainability, they will not achieve the required results when used solely in isolation. Whole college thinking, or whole campus thinking is what is really required because 'learning must be married to change, and words to action' (Blewitt, 2015, Introduction).

## Research Theme

The overarching research aim of this project was to:

- Investigate to what extent, as an active practitioner, my work can impact the ways ESD is developed in colleges where I can influence it as an insider, and to begin an excursion into unfamiliar un-researched territory to provide an agenda for future researchers.

As a result of the active practitioner research style, my work has contributed to the progression of learning for sustainability in a significant capacity, however there is still a long way to go. Indeed, it has been one of the paradoxical outcomes of this research that some of its very limitations have exposed to view, important shortcomings in the existing structure and culture. To bring about the required ‘step-change’, we have to take into account that ‘in most cases people bring to the debates on sustainable development already existing political and philosophical outlooks’ (Hopwood *et al.*, 2005, p47). This is not only true of college students and staff, but with other stakeholders and policy makers as well; all of whom will influence the progression and engagement with learning for sustainability. However, as already indicated, there has been very little published research into how sustainable development and ESD are conceived by both staff and students within Scottish Further Education (FE). Throughout this thesis I have made clear what I believe is required from sustainability learning and teaching in order to address the *environmental crisis* discussed in Chapter 2. I have also explained how my approaches and methodology aimed to meet these requirements. My research focused on implementing ESD, and therefore upon applying a change in practice and in values. However, to bring about such change, we also need to consider enablers and barriers (Exeter *et al.*, 2013), and the barriers need to be removed to ensure the changes are institutionalised (Smith, 2011).

Undoubtedly, my own research has confronted what are manifestly psychological and emotional barriers to radical change of the kind many environmental activists demand. This may indeed suggest that within the structures of our educational system there exists a kind of institutional inertia which supports, if not outright denialism then certainly passivity and indifferentism. A question remains if the college sector is for indigenous reasons more prone to this apathy than its adjacent sectors in schools and universities. Is there something intrinsic to the culture of colleges that may be inhibiting an all-encompassing embrace of ESD or do we simply face standard institutional obstacles that a

combination of effective leadership and operational performance management could readily remove? My own view is that colleges are more concerned with ‘employability’ and getting students jobs, however learning for sustainability ought to be considered an integral element of this agenda. It may be that ESD, for the multiple reasons explored in this thesis, is just not part of the college culture and that inhibitions could be removed by good ESD leadership. In a manner similar to the expectations which *demand* that staff be aware of equality and diversity in colleges, the same should be applied to ESD.

Tilbury (2011) recognised that whilst it may be easier in practice to implement projects within educational institutions that already address sustainability issues, or have a sustainability culture to a certain degree, these projects may not necessarily lead to a change in institutional culture. I would concur with this and my research findings, although constrained, appear to support this. Sustainability should not be a checklist, and in colleges it should be interdisciplinary and participatory using real world scenarios (Tilbury, 2011). I have attempted to do this, with mixed results as the research has shown. Moreover, while it may be that ‘there is a clear niche in the academic marketplace for institutions that wish to champion sustainability’ (HEFCE 2009, 35), it is *vital* that we recognise the limitations of this vision. Sustainability should no longer be considered *niche*, it has to be mainstream and adopted by all if the radical and urgent aspirations of the United Nations are to be realised.

## **Recognising the Barriers - Findings**

### **Perceived Relevance and Importance of ESD**

If the relative lack of responses were not attributable to ESD not being considered a high priority, it could be argued, as Watson (2015) suggests, that ‘periods of deep, fundamental change during which many colleges were restructured or merged, has naturally resulted in a slowdown in ESD progress’ (p93). However, if something is important to the institutions they will find the time to respond to it, even if they are busy or otherwise occupied. It may indeed be that if the survey were issued now (April 2016), the response rate would be higher with more promising ESD findings. Watson (2015) further surmises that in the sector ‘these large-scale changes are now largely complete and it is anticipated that ESD work in colleges will increase in the future’ (p93). As established, trying to embed ESD during this period with the colleges restricting was extremely challenging. However, now that the challenge has been removed, the perception remains that ESD has been ‘done’, and

it is time to move on to something else. The defining period for ESD coincided with the most turbulent period ever seen in Scottish College education. Initially it was naively assumed that sustainability would be achieved in a few years. However, it is quite clear that there is still the ‘need to raise further financial support and obtain commitment from managers and various stakeholders’ (Holm *et al.*, 2015, p165). While in key respects the painful restructuring process handicapped aspects of this research, the difficulties it faced became symptomatic of a larger problem: that despite the declared intentions, ESD proved in many cases an early casualty of change, all too readily diminished or relegated when the sector faced major pressures. There are sound reasons for believing that this can be seen as a parable of the larger fortunes of ESD.

### **Strategic Leadership and Policy**

It is of course worth observing that ESD literature tends strongly to associate effective ESD learning with leadership exercised by the full academic teaching community, particularly in the studies that have been done of higher education (HE) (Martin *et al.*, 2013). If the same mentality applies in FE, then it could naturally be argued that teaching staff also be responsible in leading the way in terms of ESD curriculum development even where strategic management is faltering. Hence, by asking college Principals to complete the survey, I may not have received a representative picture of ESD in their establishment if they themselves are too far removed to be aware of individual curriculum development endeavour. Nevertheless, I reiterate my key judgement, supported in the literature, that the presence or absence of strategic leadership in this area is crucial to its effective implementation, and is a major step forward from the reliance upon informal networks of champions, or an exclusive reliance on the content of the curriculum.

### **Lack of Resources**

If ESD is perceived as ‘complete’, then it is also likely that no more resources will be committed to it. When the work on the SFC funded *Embedding ESD in the Scottish College Project*, emerged, first managed by Colleges Scotland then by the EAUC, I was appointed Project Consultant: ‘however when project funding came to an end, the leaders for Sustainable Development felt abandoned and not supported anymore, as policy makers did not extend project funding’ (Verhulst & Lambrechts, 2015, p195). I was employed to aid colleges with the progression of ESD but this did not continue with extended funding. Verhulst and Lambrechts (2015) recognised that this can lead to:

local leaders for sustainable development becoming demotivated after their projects finished, because there was no (financial) support for continuing or related projects, meaning that not much happened with the work they completed. There was growing insecurity about the continuity of sustainable development integration and disappointment after projects were reported, as project results were not fully implemented in the general structure of the organisation (p199).

Furthermore, 'it is not the remit of sustainability to determine the research ambitions of academics. Nevertheless, the growing sustainability expertise among staff has facilitated new and successful funding bids' (Taylor, 2013, Chapter 12), however, this funding is not apparent in FE. It is important that we try to understand why funding can prove so elusive.

Holm *et al.*, (2015) identified challenges that even now still need to be overcome, including crucially the one of communication, primarily to 'interpret sustainability with a wider meaning and not solely in ecological terms and secondly translating the "added" value of sustainability to different stakeholders' (p165). Further challenges are 'to raise further financial support and obtain commitment from management and various stakeholders and the need for concrete projects that demonstrate what can be achieved, how and why' (p165). It seems to be clear from my research that there are two choices here: either the required funding is rigorously ring-fenced in order to pay for the key interventions supporting sustainability; or ESD becomes so core to the work of FE that it is funded on exactly the same basis as any other activity.

However, funding is not the only resource issue affecting learning for sustainability in Scottish FE. Just as crucially, time and commitment are also still required because the sector does not appear to understand that ESD will not be achieved overnight or make a difference overnight, it is a long term commitment. As well as this, there needs to be time attributed to students and timetables in order to engage with learning for sustainability. Owing to timetables being squeezed over the years, periods of directed or self-study, where extra-curricular activities conducive to ESD could be incorporated, are largely non-existent. In the light of this, it is more crucial than ever that ESD is comprehensively embedded within the curriculum, especially as this extra-curricular route for ESD has been severely restricted, if not removed altogether.

### **‘Sustainability Champions’ and ESD Practitioners**

Verhulst and Lambrechts (2015), have recognised that in order to successfully integrate sustainability learning within HE, the role of individuals, though crucial, is often overlooked as an important success factor. While acknowledging the value of this observation, it has been a key finding of this study that there is a need to move beyond sustainability champions, who do not have a formal remit for ESD, to ‘securing a small team whose priority is to focus on sustainability, as distinct from relying on the enthusiasm of staff whose professional remit lies in teaching, research, computing systems or elsewhere’ (Taylor, 2013, Chapter 12). It seems clear from the present investigation that sustainability champions represent a transitional phase in the embrace of ESD. Their enabling role has certainly proved vital in many settings, but it can become a hindrance to the critically vital factor of corporate, institution-wide ownership of the vision and the tasks of ESD. At best, it can act as an alibi for institutional inaction. At its worst, it becomes insincere and tokenistic.

Plant (1995) realised two decades ago that discourse in the field of sustainable development needs to be continually and reflexively re-conceptualized in order to avoid such traps. However, this should not only be by academics and policy-makers. ‘The urgent societal need and broad call for sustainable development allow universities to assume a fundamental and moral responsibility in contributing to sustainable development and to guide society on its path towards a sustainable future’ (Waas, *et al.*, 2010, p629). However, McCoshan and Martin (2014) found that ‘in some cases institution-wide curriculum change processes are reported to have had a lukewarm reception with staff and students, thereby failing to provide fertile ground for the introduction of sustainability principles’ (p6). This is why it is vitally important that ESD Practitioners, named Sustainability Champions and students alike are involved with a bottom-up approach in discourse re-conceptualization, because only then will true educational reform happen and ESD become an informing principle in institutional culture.

That said, in all three of the case studies, the driving institutional force for change was individual commitment, both from the staff who requested I work with their college, and at the college where I am employed, both by myself and through the enthusiastic lecturer with whom I worked. It has been recognised widely in the literature that an important driver is the individual commitment of one or several members of staff who feel responsible at a personal level and these people can be considered as leaders or change

agents for sustainability within an organisation (Cavagnaro & Curiel, 2012). In this same spirit the figure of the sustainability champion has something important to teach us: that even when institutions do achieve authentic corporate ownership of ESD, this is inseparable from individual ethical and educational commitment to the project of building a sustainable society and economy.

### **ESD as an Employability Tool**

Appropriate funding streams may be one route to ensure colleges engage with sustainability materials, but funding on its own may not be a great enough incentive. Ensuring sustainability is viewed by colleges as a *vital employability skill* is another potential attractor. This can be evidenced by work of the David Hume Institute (2013), which recognised that,

there is always scope to increase ‘employability; and to encourage skills development – particularly in preparing those who will undertake the plentiful and important jobs that demand somewhat lower levels of skills and more limited qualifications than Higher National Diplomas – which provides a case to regularly re-visit course and curriculum design (p3).

This is the very promising zone where ESD can be naturally aligned with employability and validated as a skill required by Scotland’s workforce. To achieve this degree of recognition, the curriculum needs to be designed to ensure that there is meaningful space for learning for sustainability to be accommodated and integrated as part of the process of becoming an employable person and a democratically active participating citizen. However, behind this insight lies a larger and very contemporary question: how do we build models of work, labour, wealth creation, prosperity, and personal fulfilment in which the moral conception of sustainability is an individual and community asset. Recent developments in Scotland, whereby the Scottish Government published their first *Circular Economy Strategy* (February 2016), highlighting how Scotland aims to move towards a circular economy, and its particular appeal to small nation democracies, illustrates very promisingly the potential that lies in seeing education in and for sustainability as a leading edge employability attribute. Care, does however, need to be taken that the circular economy is not seen as anti-growth or anti-prosperity, but it is about a new understanding of development and Scotland as a small nation democracy is in a key position to embrace it.

## Community Engagement

As previously intimated, college engagement patterns in line with social inclusion strategies may be another route to circumvent the impasse of perceived ESD deficiencies. In terms of considering the extent to which tertiary education engages with local communities to build capacity for sustainable development, a study by Shiel *et al.* (2016), included one respondent who commented that ‘it might be interesting to compare HE to FE, because the latter has much greater implicit obligation to respond to local needs’ (p127). For example, ‘strategic elements that would catalyse the promotion and enhancement of capacity building for sustainable development at a community level include enabling university facilities to be used by a variety of stakeholders such as the public and local schools’ (Shiel *et al.*, 2016, p124). Colleges already do such work very successfully in many cases. When colleges perform at their best, the mesh between them and other agents such as industry, commerce, retail, social enterprise and the voluntary sector are evident. There is a pre-existing structure here from which the college can ramp up community engagement. There is also the opportunity to move beyond the dissemination and publicity model to a genuine knowledge exchange which can be harnessed to student learning. For example, small businesses should be able to approach colleges to learn about sustainable development from students to enhance their business, in the same way that they offer work placements to students to further the students’ employability skills. However, this has to be true integration of engagement and not merely an afterthought. This corroborates the point I made in Chapter Four, that developing successful learning for sustainability may be even more crucial at FE level than HE, if in turn there is more successful community engagement from FE.

## Students as Co-Constructors

Students need to be co-constructors in determining appropriate learning for sustainability to overcome the obstacles of perceived irrelevance, which in turn, by their participation help reduce the barriers of time constraints in an already overcrowded curriculum: but what do we mean by co-constructors? The FE sector in general has pioneered exciting new versions of student learning which seek to incorporate the compelling elements of transmission learning and core knowledge in a larger conception of shared knowledge production, expertise and skills development. The mainstream epistemologies of the sector have always accorded prestige and recognition to experiences such as: apprenticeship learning, project based discovery, collaborative and product based design learning, and



technical and computational thinking. These are natural contexts for the co-construction of knowledge, theory and outputs. This affords a genuine advantage when seeking to promote ESD within this same ecology of learning and performance. This is critical, because to change your values, you have to learn more than just the facts, you have to own and construct it yourself for it to be meaningful. A powerful term for this in contemporary educational theory is student immersion and student immersion lends itself to the expectations of ESD. Also, by total student immersion, we reduce the risk of ‘reifying ESD policy’ (Stevenson, 2006, p287), because as Stevenson (2006) worries:

the reification of international policy discourse can imply an unquestioning faith in so-called ‘experts’ and authorities, in centralized global institutions and inter-Governmental agreements, and in top-down approaches to educational reform (p287).

The real impetus for resolving the challenges to successful learning for sustainability will only happen when all interested parties, from students at the forefront of learning, and policy makers at the planning of learning, are considered equally as important as co-constructors for educational reform. Projects to date have stalled once they have been completed because of ‘lack of support, local leaders for sustainable development did not always feel supported by colleagues or policy makers, as they did not see the relevance of the topic’ (Verhulst & Lambrechts, 2015, p199). In other words, the knowledge generated by them has not entered the bloodstream of students and institutional learning.

Furthermore, as several case studies have shown, a project or intervention may make inroads at the time but ‘often these instruments and models were not successfully and structurally embedded within the organisation’ (Verhulst & Lambrechts, 2015, p197). It therefore seems clear that more collaboration is essential across societal sectors. Multi-stakeholder collaborations are critical; ‘bringing together people of various backgrounds and with different values, perspectives, knowledge and experiences’ (Rowe *et al.*, 2015 p118).

### **Quality Assurance, Enhancement and Assessment**

Even when there is across the sector successful staff engagement and clear learning for sustainability in the curriculum, there is still the requirement to assess if it has had any impact. This is vital because:

Without appropriate measures of outcomes, it will become increasingly difficult to assess progress. Perhaps it is also necessary to look at university targets and processes through the lens of sustainability in order to develop appropriate tools (McCoshan & Martin, 2014, p6).

The UK HEFCE funded project *Leading Curriculum Change for Sustainability* seeks to embed education for sustainability into university quality assurance and enhancement systems and change higher education curriculum accordingly (Tilbury, 2011, p10). My research surely demonstrates that a parallel shift in the quality assurance and enhancement regimes of FE is also overdue. Care needs to be taken, in a similar manner to curriculum development, that there is co-construction of quality enhancement for it to be transformative. All parts of the institution, and beyond to external stakeholders and partners, have to be consulted, otherwise there is a danger that quality assurance quickly becomes a tick box routine that no longer enhances.

In Scotland, the Learning for Sustainability Implementation Group (2016) has very recently recognised a number of key challenges. It is important to note that this work refers almost entirely to schools. Nevertheless, it yields extremely valuable insight in its inventory of aspirations for Scottish education over the next fifteen years:

- Promoting awareness of learning for sustainability as a concept and process so it is universally understood.
- Taking learning for sustainability forward at a time of financial constraint with growing pressures on staff at school level and system leaders at local and national level.
- Embedding learning for sustainability in professional review and development processes at school level or through self-evaluation, to ensure it is not treated superficially but rather that it brings about more profound and deeper change.
- Ensuring that learning for sustainability is not crowded out of school, local and national improvement plans due to other priorities and initiatives (p4).

It is extremely encouraging to see how strongly this checklist echoes the findings of my work. However, its application to Scotland's Colleges is not unproblematic, for reasons also ventilated in this thesis. In order for these bullet points to gain traction in Scotland's Colleges we would need to ensure the peculiar challenges faced by FE because of its role

are recognised, and also make use of the tremendous opportunities that exist given the nature of FE.

### How to Remove the Barriers - Solutions and Recommendations

In the light of the research findings, and in relation to removing the barriers obstructing successful learning for sustainability, the following broad agenda for reform strongly commends itself to all levels of decision maker and actor.

- **Strategic Leadership** – Learning for Sustainability needs to be accorded priority from the centre and be driven and monitored by College Principals. Therefore, this should be part of College Principals' training.
- **Policy and Practice** – Effective policy has to be implemented. The colleges that show the greatest progress in ESD have strategic policy documents stating the importance of sustainability within the institution. These policy documents must make clear what is required in practice to embed learning for sustainability in the curriculum. Furthermore, there has to be staff ownership of the policy and democratic agency for staff on how the implementation of policy is to be measured and assessed. This could be achieved by an improvement cycle which sets targets with rewards for institutions that are leading in ESD implementation of a policy.
- **Students as Co-constructors** – Students need to be involved in the learning for sustainability practice, both as co-constructors of what works in the classroom to link sustainability to their curriculum area, but also as a vital component for driving sustainability across the wider campus. The work student groups undertake outside of the class in fundraising and volunteering needs to be identified to them as ESD.
- **Timetabling Changes** – There needs to be timetabled spaces in the curriculum for these other avenues to be explored. This may appear to be trivial but in the environment of the sector the timetable is a crucial instrument of learning. A restoration of a collaborative reflective space which would enable students to think deeper of their own commitments and motivations is necessary for changing values.
- **Linking Campus, Curriculum and Community** – These initiatives already exist, however again they need to be recognised as ESD initiatives, not only by staff driving them, but by students who partake in them also. It needs to be fully understood, recognised and exploited: colleges are in a unique position as knowledge hubs and should accordingly be utilised as such.

- **Quality Assurance and Enhancement** – This needs to be strengthened in Scotland’s Colleges. Education Scotland should make learning for sustainability a specific and ongoing priority for evaluation. It needs to be more visionary with quality enhancement dialogue on what constitutes quality, with ESD at the heart of it. Performance indicators could be used as a catalyst to kick-start ESD – to ensure colleges are aware of what is expected of them.
- **Sustainability Assessment** – If all areas of the curriculum should have learning for sustainability included and delivered within them, then all assessments need to recognise this. The Scottish Qualifications Authority needs to ensure sustainability assessment is in its criteria.
- **ESD for Employability** – Learning for sustainability should be recognised and utilised as an important employability tool and effectively measured. Transforming the vision of employability, workers of tomorrow need to have skills and knowledge about concepts such as life cycle analysis and the circular economy to be future thinking and at the cutting edge.
- **ESD Practitioners: beyond champions** – ESD Practitioners with relevant experience need to be employed in the Scottish College sector to help teaching staff incorporate sustainability in their teaching. Furthermore, ESD Practitioners can help to implement many other of these solutions also, but they need to exist to do so. Sustainability Champions in colleges – whilst *currently* vital – need to be recognised as an important if interim or transitional role. There needs to be specific remit to deliver learning for sustainability in a fashion that will eventually end the need for champions.
- **Resources** – The need for resources ought to be seen as paramount. This needs to be recognised, not only the financial commitment, but space in the curriculum and the time required to embed learning for sustainability which will not be achieved in a few short years. This is about investing in a future academic infrastructure that can do this.

## Limitations

### Survey Timing and Response

First and foremost, the survey deliberately isolated a particular moment in time. The point of choosing that moment was not arbitrary, it was chosen because it was the moment of ESD implementation to determine what was happening. It was the optimum moment,

when chosen, because of government sustainable development policy and strategy, economic development, curriculum reform and assessment. It was the optimum time to determine if the changes advocated by the Scottish Government were actually making any difference in FE. However, once the research process was underway, the Scottish FE sector imploded!

Unfortunately, that chosen *moment* coincided with the most turbulent period ever in Scottish College education. The timing of the survey, and subsequent lack of response, is reflected throughout the research, as well as the impact this limitation also had upon the progression of the case studies. However, every effort has been made to comprehend the pattern of data collection and the context out of which that data was generated in order to understand more comprehensively the operation of the colleges in relation to ESD. It would appear that ESD was one of the first things to be jettisoned. This research turned out to be one also about colleges in transmission or flux, and the very phenomenon of transition has become one the unexpected realisations of the thesis.

The survey response rate was unfortunately low, however, this has become in itself an object of methodological interest. It exposes conditioning factors such as how quickly ESD seemed to lose focus, and the vulnerability or fragility of ESD, despite the political rhetoric and trumpeted success stories – moreover, it exposed the vulnerability of the whole college domain, which was expressed in the very erratic survey response. Furthermore, even where responses were received, they only reflected the impression of ESD of one individual in that college – and it is very probable that not every respondent had a fully knowledgeable and accurate overview of ESD work and progression within their college. This was in fact evidenced by some of the responses received.

### **Case Study Groups**

One of the case study groups only participated in the survey prior to using the learning for sustainability materials. Both of the other case study classes were small in size, and the sample size decreased after using the learning for sustainability materials in both cases as students left college without completing the course. However, case studies do not have to be big to be validated, and nevertheless, the case studies utilised the opinion of real life students which exposed important light on the experience of ESD from the learners' position.

## **Engaging with Those who had already shown a Commitment to ESD**

The colleges which agreed to take part in the case studies, were colleges which had already shown a commitment to ESD, either because of work they had already conducted around sustainability, and in light of sustainability champions pushing sustainable development within these institutions. These were the beacon institutions who were already championing the agenda. However, if this is the vanguard of ESD in the sector and I have discerned this very mixed pattern of strengths and weaknesses, what does this say about the rest of the sector. In some form or other, all of the case studies showed significant commitment to the ESD agenda, yet I was able to identify inconsistencies and irregularities in their performances. This does not bode well for the rest of the sector who are not as committed.

## **Long Term Behaviour Change**

The research does not measure long term behaviour change, or whether the learning for sustainability materials impacted upon staff and students personal or employment lives. It is not a longitudinal survey, but nevertheless the research has accentuated the impact of transformative events, such as the merger process, upon education. Moving forwards this type of punctuated equilibrium may become more common upon long term behaviour in society and the college system, because what the colleges endured might serve as a microcosm of what society will endure if the environmental crisis is not addressed.

## **Further Research**

### **Linking Campus and Curriculum and the use of Strategic Documentation**

I have tried to implement processes to measure progress by making learning for sustainability a central theme of the college's Carbon Management Plan (CMP) in the college where I am employed. This may at first appear to be an external non-curricular initiative, which is unlikely to affect the overall values and disposition in the college community. However, including learning for sustainability in a CMP elevates it to the status of a Climate Change Action Plan (CCAP) (EAUC, n.d.), which genuinely does possess the potential to impact on a broad band of college experiences. Of those colleges that replied, 75% had a CMP, therefore embedding learning for sustainability within CMPs to make them CCAPs could be an effective way of addressing sustainability within Scotland's colleges.

There are specific targets relating to learning for sustainability in the CCAP where I am employed including:

- Sustainability awareness training during all new college staff induction.
- Sustainability continuous professional development for all existing college staff.
- A different cross college sustainability awareness campaign each month.
- Credit rating through the Scottish Credit and Qualifications Framework, further sustainability learning and teaching materials.
- A full curriculum sustainability audit to be conducted by the end of the five-year period the CCAP covers.

It should be clear from this inventory that a resolution of this kind can imprint the whole culture of the institution and its capacity for learning. Ensuring appropriate sustainability training for all staff is an important first step to embedding sustainability across the entire college campus and curriculum in this context. The Higher Education Academy's evaluation of the Green Academy Programme established that in some institutions successful staff development 'helped to build capacity, raise awareness and further engage staff on how to take the agenda forward and that by providing sessions for academic and support staff during staff development week, this allowed ideas for embedding sustainability into the curriculum and research to be debated' (McCoshan & Martin, 2014, p14). As well as pursuing the important indicator of reduced campus carbon emissions the CCAP harbours real potential to shift minds and attitudes and to permeate the full curriculum of learning and teaching. This could be achieved by removing the enclaves around ESD, whereby it is seen as either the remit of estates departments and campus management by curriculum staff, and vice versa if college support staff believe learning for sustainability is exclusively an academic responsibility. Under these circumstances no-one takes charge or, indeed, believes they are obligated to do so.

What the institution does and what it teaches need to converge, however the very nature of FE makes this viable because of how they mesh with society. Total immersion in ESD by colleges, where they are not aware of doing ESD separate from anything else is the ultimate goal, and this is one possible route to achieving this. Whilst the logic of using the CCAP as a tool to overcome the inertia of learning for sustainability progress is evident, it is too early yet to see if this potential will be realised and further investigation is required.

## **Quality Assurance and Assessment**

Where appropriate quality assurance and enhancement has been implemented through Education Scotland reviews, it has been inconsistent in measuring learning for sustainability. In the latest college review I examined (April 2016), sustainability is only mentioned once. It would appear learning for sustainability is not being evaluated in any depth. More work is required into not only the level of quality assurance, but the impact of quality enhancement as well.

Learning for sustainability teaching materials require appropriate levelling and credit rating, and then, even more critically the use of them needs to be assessed. There then would follow research into the impact of changing student attitudes to sustainability if the work is accredited, assessed and certificated.

## **Long-term Behaviour Change**

My materials are being used, but their long term value remains to be fully assessed. Now that the sector has settled to a certain extent, I think colleges would be more willing to engage with me, both as users of the materials and to provide feedback. To measure this, there is the need for a proper tool to gauge the effectiveness of my materials over a 2-year and 5-year period. I want the materials to be a 'go to' resource – but with a built in obsolescence because I want them to contribute to curricular and cultural realignment over the next few years and then teaching staff will design their own, as sustainable thinking will be ingrained – so my materials will be no longer required.

This would be the next logical step, and upon completion of the materials there would be research required to assess if any long-term behaviour changes had been implemented by the users. Research to establish this would be significant, not only to determine changes in their personal lives, but also to recognise if their practice at work was more sustainable. This research could help determine how Scotland can make the move towards a circular economy which the Scottish Government is promoting. However, in order to understand what the circular economy is, people need to know what sustainability and sustainable development are also.

Society will need to learn to adapt and become more resilient, as will the education sector, therefore ESD has to be a bit more real. Colleges will need to learn to cope with and recover from crises, and can learn from recent experience of how to do this. Further



investigation is required into how colleges can successfully adapt to be future thinking, to include new ways of working for capacity building and reinventing themselves with greater endurance.

## **Final Conclusions**

If sustainable development is seen as one of the most critical challenges facing humanity, and one of the solutions to meeting this challenge is learning for sustainability, then there is still considerable progress required in Scotland's Colleges. My research has made it clear that an integrated approach is vital as is evidenced by the colleges which are successfully engaging with learning for sustainability to a greater extent. These colleges have adopted a range of approaches including: strategic documentation to address the environment and sustainability; evidence of ESD materials being utilised within the curriculum (both my materials and other initiatives); the use of Sustainability Champions and/or an ESD Practitioner. However, this needs to be taken further to also ensure there is management buy-in, cross-campus collaboration and a bottom-up approach, recognising not only the importance of all invested stakeholders, but also the significance of students to strengthen the overall implementation of learning for sustainability.

I began this research hoping to make a difference within Scotland's Colleges and finish believing I have achieved my aim of contributing to the progression of learning for sustainability in the sector. However, my main concern is that those stakeholders which have the power believe the learning for sustainability journey is largely complete, and that the relevant resources that are still required are no longer forthcoming. Only once the approach is adopted, that what colleges do and what they teach about learning for sustainability must be the same thing, will the college culture be totally transformed to ensure colleges deliver future thinking sustainable education.

## Appendix I - ETHICS AND CONSENT PAPERWORK



### Ethics Committee for Non Clinical Research Involving Human Subjects

#### **Postgraduate Research: NOTIFICATION OF ETHICS APPLICATION OUTCOME**

##### **Application Details**

Application Type: New  
(select from drop down as appropriate)

Application Number: CSS20120229

Applicant's Name: Elaine Crawford

Project Title: Embedding education for sustainable development within the curriculum in Scotland's colleges.

Date Application Reviewed: 30Oct12

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##### **Application Outcome**

☒ **Fully Approved**  
(select from drop down as appropriate)

***Start Date of Approval: 02 November 2012***

***End Date of Approval: 12 September***

**2014**

If the applicant has been given approval subject to amendments this means they can proceed with their data collection with effect from the date of approval, however they should note the following applies to their application:

☐ Approved Subject to Amendments without the need to submit amendments to the Supervisor

☐ Approved Subject to Amendments made to the satisfaction of the applicant's Supervisor

*Some amendments only need to be submitted to an applicant's supervisor. This will apply to essential items that an applicant must address prior to ethical approval being granted, however as the associated research ethics risks are considered to be low, consequently the applicant's response need only be reviewed and cleared by the applicant's supervisor before the research can properly begin. If any application is processed under this outcome the Supervisor will need to inform the College Ethics Secretary that the application has been re-submitted (and include the final outcome).*

☐ Approved Subject to Amendments made to the satisfaction of the College Ethics & Research Committee

The College Research Ethics Committee expects the applicant to act responsibly in addressing the recommended amendments.

A covering note (letter or email) must be provided highlighting how the major and minor recommendations have been addressed.

☐ **Application is Not Approved at this Time**

Please note the comments below and provide further information where requested. The full application should then be sent to the College Office via e-mail to [Terri.Hume@glasgow.ac.uk](mailto:Terri.Hume@glasgow.ac.uk). You must include a covering letter to explain the changes you have made to the application.

☐ **Select Option**

*(select from drop down as appropriate)*

*This section only applies to applicants whose original application was approved but required amendments.*

**Application Comments**

**Major Recommendations:** *(where applicable)*

There are no recommendations in this section.

**Minor Recommendations:** *(where applicable)*

PLS

It would be helpful to participants if you indicated how long it will take to complete questionnaires.

Questionnaire

Consider whether it is necessary for participants to put their name to the questionnaire.

If amendments have been recommended, **please ensure that copies of amended documents are provided to the College Office** for completion of your ethics file.

**Reviewer Comments** *(other than specific recommendations)*

Please be mindful that research instruments used beyond the pilot phase will require to be submitted to the CoSS ethics office for approval before data collection begins for main study.

Please note that the written permissions require to be lodged with the CoSS ethics office prior to data collection.

Please notify CoSS ethics office when additional College has been decided.

Please retain this notification for future reference. If you have any queries please do not hesitate to contact Terri Hume, Ethics Secretary, in Room 104, Florentine House, 53 Hillhead Street, Glasgow G12 8QF.

End of notification.

### Consent Form – College Management

**Title of Project:** Embedding education for sustainable development within the curriculum in Scotland's colleges.

**Name of Researcher:** Elaine Crawford

1. I confirm that I have read and understand the Plain Language Statement for the above study and have had the opportunity to ask questions and understand the study is for research purposes.
2. I understand that the participation of Adam Smith College is voluntary and that the College is free to withdraw consent and withdraw any data previously supplied, without giving any reason.
3. I consent to questionnaires being distributed to staff and students and to focus groups in the College being recorded and understand that transcripts will be made available to the College if requested.
4. I agree / do not agree (delete as applicable) for the College to take part in the above study.

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Position in College

\_\_\_\_\_  
Researcher

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

## Consent Form – College Staff and Students

**Title of Project:** Embedding education for sustainable development in the curriculum in Scotland's colleges.

**Name of Researcher:** Elaine Crawford

1. I confirm that I have read and understand the Plain Language Statement for the above study and have had the opportunity to ask questions and understand the study is for research purposes.
2. I understand that my participation is voluntary and that I am free to withdraw at any time and withdraw any data previously supplied, without giving any reason.
3. I give consent to completing questionnaires and for focus group meeting I attend being recorded and understand that transcripts will be returned to me for verification. I also acknowledge that I will not be identified by name in any publications arising from the research.
4. I understand that participation or non-participation in the research will have no effect on my assessment grades or employment in the college.
5. I agree / do not agree (delete as applicable) to take part in the above study.

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Researcher

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

## Plain Language Statement

### Research Title

Embedding education for sustainable development within the curriculum in Scotland's colleges

### Researcher Details

Mrs Elaine Crawford  
University of Glasgow  
School of Interdisciplinary Studies  
Rutherford McCowan  
Bankend Road  
Dumfries  
DG1 4ZL

I am conducting a research project as a student of the University of Glasgow and would like to invite you to take part in this study. Before you decide if you wish to participate it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information and take time to decide whether or not you wish to take part.

Thank you for reading this.

### What is the purpose of the study?

Sustainable development is development that not only includes economic growth but that considers social needs and environmental concerns at the same time. The purpose of the study is to establish the extent to which education for sustainable development (ESD) is understood and embedded within the curriculum in Scotland's Colleges. The Scottish Government has acknowledged that education is essential to tackle environmental concerns and to ensure people have the knowledge, skills, values and understanding to live more sustainably; ESD should be considered a strategic priority at all levels of education. However, it has also been determined that a considerable amount of work is required to embed ESD within the curriculum in Scotland's Colleges. This study intends to determine the best approaches for achieving this in a meaningful manner to the student and College staff, with the aim that students will be provided with ESD skills and goals to live by that can be taken into the workplace and their personal lives. This study also wants to determine the best methods to use in order to progress ESD in the curriculum in Scotland's colleges. I have produced teaching materials and methods to help embed ESD in the curriculum and this research will assess staff and student opinions of these materials to determine if they are successful or not.

### Why have I been chosen?

You have been chosen either as a college student or a member of college staff who has had contact with, or will have contact with, the teaching materials and approaches I have developed to try and embed ESD in the curriculum. Your participation may help to determine how ESD is progressed in Scotland's Colleges in the future.

### Do I have to take part?

No, the decision to take part is voluntary and it is entirely your own decision if you take part or not. You are also free to withdraw from the study at any time and withdraw any information you had previously supplied.

### What will happen to me if I take part?

You will not be identified by name either in my research or to college staff or management.

### What will I need to do?

You will be asked to complete two questionnaires and attend a focus group meeting. The questionnaire will take approximately twenty minutes to complete and the focus group meeting will last approximately one hour and will take place in the college over the course of the academic year 2012/13. During this time you will be asked questions about education for sustainable development and your opinion of the teaching materials I have developed.

### **Will my taking part in this study be kept confidential?**

Yes, anything you say will be confidential. Any reference to what you say that is used in my report will be with your permission and will not refer to you by name or advise the name of the college you are associated with. All of the paper data collected will be de-identified and the data and the identifiers will be kept in separate locked filing cabinets. Any data held on computer will be password protected. The identifiers will not be able to name individuals but will identify whether the participant is a student or staff member and the department of which they are a member. All data will be destroyed 10 years after my research ends.

### **What will happen to the results of the research study?**

The results of the research study will be advised in my thesis. The results may also be presented at conferences and in journal articles, however any reference to anything you say will be confidential and with your permission. The results will also be made available to you if you request to see them.

### **Who is organising and funding the research?**

The research is funded by a University of Glasgow College of Social Sciences scholarship.

### **Who has reviewed the study?**

The study has been reviewed by the University of Glasgow's College of Social Sciences Ethics Committee

### **Contact for Further Information**

For further information about the study, please contact Elaine Crawford at:

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Or my supervisors, Dr Bethan Wood at:

[bethan.wood@glasgow.ac.uk](mailto:bethan.wood@glasgow.ac.uk)

Tel: 01387 702096

Or Professor Bob Davis at:

[robert.davis@glasgow.ac.uk](mailto:robert.davis@glasgow.ac.uk)

Tel: 0141 330 3001

In addition if you have any concerns regarding the conduct of the research project please contact the College of Social Sciences Ethics Officer Professor John McKernan at:

[john.mckernan@glasgow.ac.uk](mailto:john.mckernan@glasgow.ac.uk)

Tel: 0141 330 6029

## Appendix II - SURVEY ISSUED TO COLLEGE PRINCIPALS



### Study into the progress of embedding education for sustainable development (ESD) within the curriculum in Scotland's Colleges

#### Background

This questionnaire is part of a survey of all of Scotland's Colleges. The survey explores the extent to which education for sustainable development (ESD) is understood and embedded within the curriculum in Scotland's Colleges. The aim is to:

- Establish the level of awareness of ESD at strategic levels across the Scottish College sector; and
- Record opinions of ESD teaching materials which have been developed as part of this study.

Funding for the research is from the University of Glasgow as part of doctoral research and from the Scottish Funding Council as part of the ESD Scottish College Project which is managed by the Environmental Association of Universities and Colleges (EAUC).

Results should be available from June 2014 and will be sent out to all College participants who request it. **Individual responses will not be attributed to specific Colleges and all responses will be treated confidentially.** As this study is part of doctoral research the results may be presented in a variety of forms including conference papers, articles and in a research thesis.

#### Instructions

The questionnaire has 19 questions and will take around 15 to 20 minutes to complete. Please follow the instructions and answer as many questions as you can. It is split into two sections, the first section mainly asks for free form responses and the second section has options to choose from with space to provide further information where required. If you feel there is someone within your institution better suited to respond to the questionnaire, please forward it to them. For further information about the research project, or for help with answering the questions, please contact Elaine Crawford on 01387 734132 or [crawforde@dumgal.ac.uk](mailto:crawforde@dumgal.ac.uk)

#### Terms Used

***Education for Sustainable Development*** (ESD) is used to mean teaching and learning that promotes sustainable development.



***Sustainable Development*** is most commonly referred to as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’.

### **Part One: Level of awareness of ESD at a strategic level in the College**

1. What policy documents, if any, do you refer to for guidance on ESD?
  
2. How do you evaluate policy documents on ESD and how important do you believe they are?
  
3. Which organisations, if any, do you refer to for guidance on ESD?
  
4. How much of a priority do you consider ESD to be within your institution? (Please tick the most appropriate answer)  
     No priority  
     Low priority  
     Medium priority  
     High priority  
     Highest priority
  
5. Have you developed your own policy documents in your institution to address ESD?  
     (For example, a Sustainability Policy, Fair Trade Policy, a Carbon Management Plan etc.)
  
6. How does your work within the College reflect your own policy documents? (For example if you have a Carbon Management Plan, by how much have you reduced your carbon emissions?)
  
7. If you have a Sustainability Policy, (or another similar policy), what reference does it make to the curriculum?

8. Have you audited ESD practice across the curriculum and/or in relation to your Sustainability Policy?
- YES
- NO

9. How well embedded is ESD in the curriculum in your institution? (Please tick the most appropriate answer)

ESD is very widespread in most College departments

ESD is quite widespread in a number of College departments

ESD is not very widespread and is only embedded in a few College departments

ESD is not embedded at all

10. What processes, if any, do you have in place to develop ESD in the curriculum?

11. What do you know about the United Nations Decade of Education for Sustainable Development and how have you responded to it within your institution?

## **Part Two: Opinions of ESD teaching materials provided as part of this project**

**The Introduction to Sustainability Workbook that the following questions refer to was forwarded to all Colleges in Scotland in September 2013 by Scotland's Colleges. A copy of the Workbook is also provided with this survey.**

12. Have you used the Introduction to Sustainability Workbook in the college?

YES (If yes, please provide details of who has used it, i.e., staff or students, and an approximate number of staff and/or students that have used it)

NO (If no, please can you advise the reason it has not been used)

13. If you have not used the Introduction to Sustainability Workbook yet, do you intend to use it in the future?

YES

NO

(Please provide a reason for your answer in the free form box)

14. Did you find the Introduction to Sustainability Workbook useful?

YES

NO

(Please provide a reason for your answer)

15. What did you think were the main strengths and weaknesses of the Introduction to Sustainability Workbook?

STRENGTHS (Free form text box)

WEAKNESSESS (Free form text box)

16. Did they find any chapters in the Introduction to Sustainability Workbook difficult to understand?

YES (Please advise which chapters in free form text box)

NO

17. Have you introduced or do you intend to introduce any of the activities in the Introduction to Sustainability Workbook?

YES (Please advise which activities in a free form text box)

NO

18. Have you obtained any feedback from anyone who has completed the Introduction to Sustainability Workbook?

YES (Please provide details in a free form text box)

NO

19. If you have not used the Introduction to Sustainability Workbook, what actions would make you more inclined to use it? (For example, support from a Project Consultant for the ESD Project in Scotland's Colleges or if the materials were credit rated?)

(Free form text box)

Please tick the box if you would like to receive information from the findings of this survey.

(Tick box)

## Appendix III - STUDENT QUESTIONNAIRE - CASE STUDIES



### Student Education for Sustainable Development Questionnaire

1. What does sustainable development or education for sustainable development mean to you?  
(Please provide a written answer or leave blank if you are unsure)

2. Do you think sustainable development should be included in your course?  
(Please tick the appropriate answer)

Yes ☐ (Go to 3)

No ☐ (Go to 4)

Don't know ☐ (Go to 4)

3. In what areas of your course do you think sustainable development would best fit?  
(Please provide a written answer or leave blank if you are unsure)

4. Have you heard of the United Nations Decade of Education for Sustainable Development?  
(Please tick the appropriate answer)

Yes ☐

No ☐

Don't know ☐

5. Does the Scottish Government have a policy on education for sustainable development in Scottish college education? **(Please tick the appropriate answer)**

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>
Don't know	<input type="checkbox"/>

6. Have you heard of or had contact with the Environmental Association of Universities and Colleges? **(Please tick the appropriate answer)**

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>
Don't know	<input type="checkbox"/>

7. Have you heard of or had contact with People and Planet? **(Please tick the appropriate answer)**

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>
Don't know	<input type="checkbox"/>

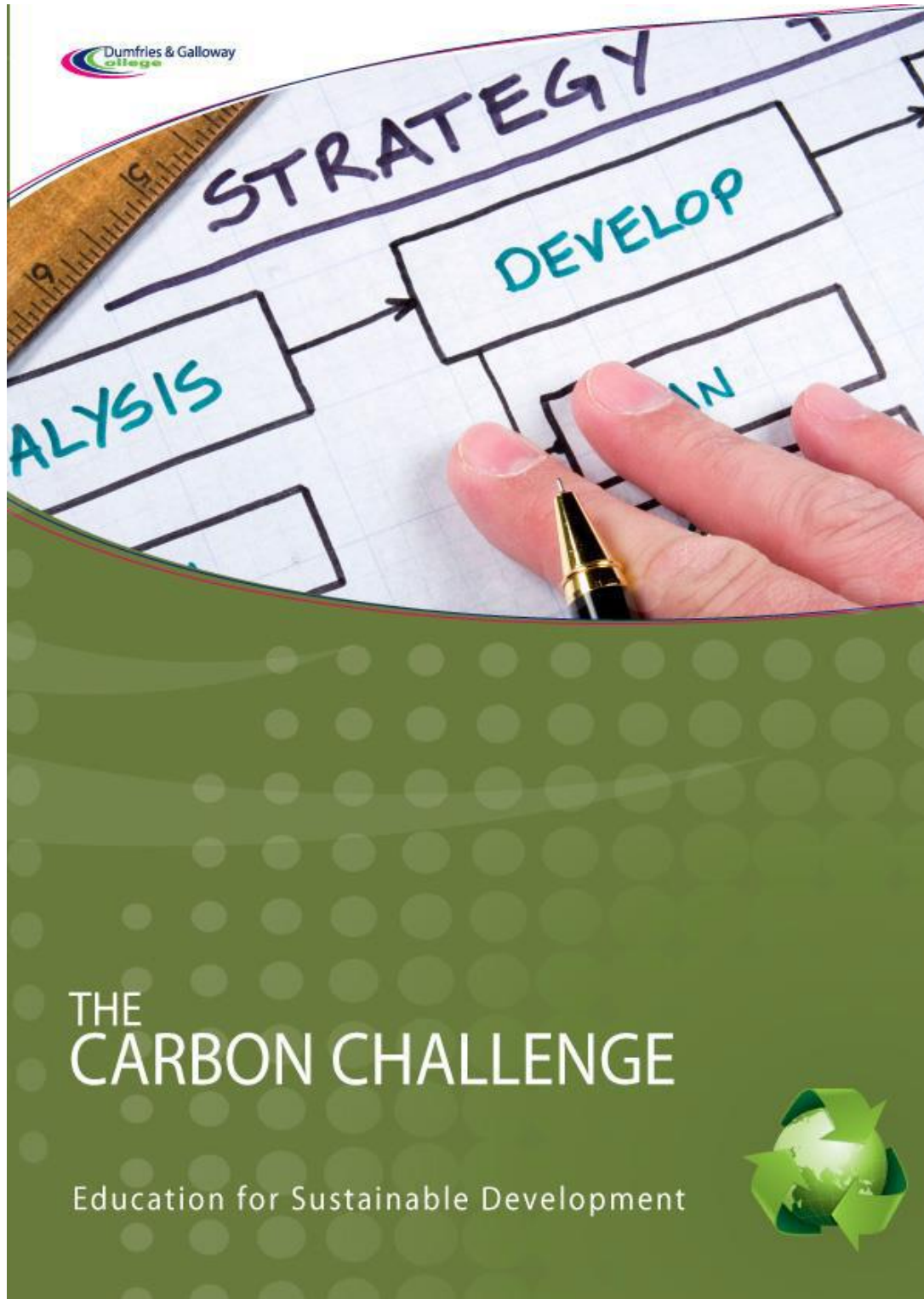
8. Does your college have a policy on sustainable development or sustainability? **(Please tick the appropriate answer)**

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>
Don't know	<input type="checkbox"/>

9. What have you been taught about sustainable development in your course already? **(Please provide a written answer or leave blank if you are unsure)**

**This information will only be used as part of the research project discussed with you and no participant will be identified to any third party.**

## Appendix IV - Introduction to Sustainability Workbook



## About this Workbook

The author of this workbook is Mrs Elaine Crawford who is the Sustainable Development Adviser at Dumfries and Galloway College. Elaine has a MA in Environmental Sustainability and an MSc in Carbon Management, both from the University of Glasgow. The project to produce this range of workbooks began during a work placement with the Crichton Carbon Centre as part of the MSc in Carbon Management, when the first workbook was produced. As a result of this, a range of workbooks is now being developed to highlight Dumfries and Galloway College's commitment to raising awareness of global issues that will affect us all and to ensure education for sustainable development is fully embedded within all aspects of the curriculum at the college. In places this workbook uses examples that are particular to Dumfries and Galloway College; however, the information it contains can easily be applied to any college. Answers are provided where appropriate; however, some of the activities do not have right or wrong answers and are designed to generate awareness and/or debate. Guidance is provided for these activities.

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# 1 INTRODUCTION

The purpose of this workbook is to introduce the importance of sustainable development and how education can be used as a tool to convey this message. There are a number of reasons why sustainability and sustainable development have increasingly come to the fore in recent years, including the issue of human induced climate change. However, sustainability also addresses issues such as population growth, the use of limited resources and social justice. The workbook begins by explaining why climate change is a cause for concern and what sustainable development and education for sustainable development are. The following chapters aim to provide the knowledge required to make decisions about living more sustainably.

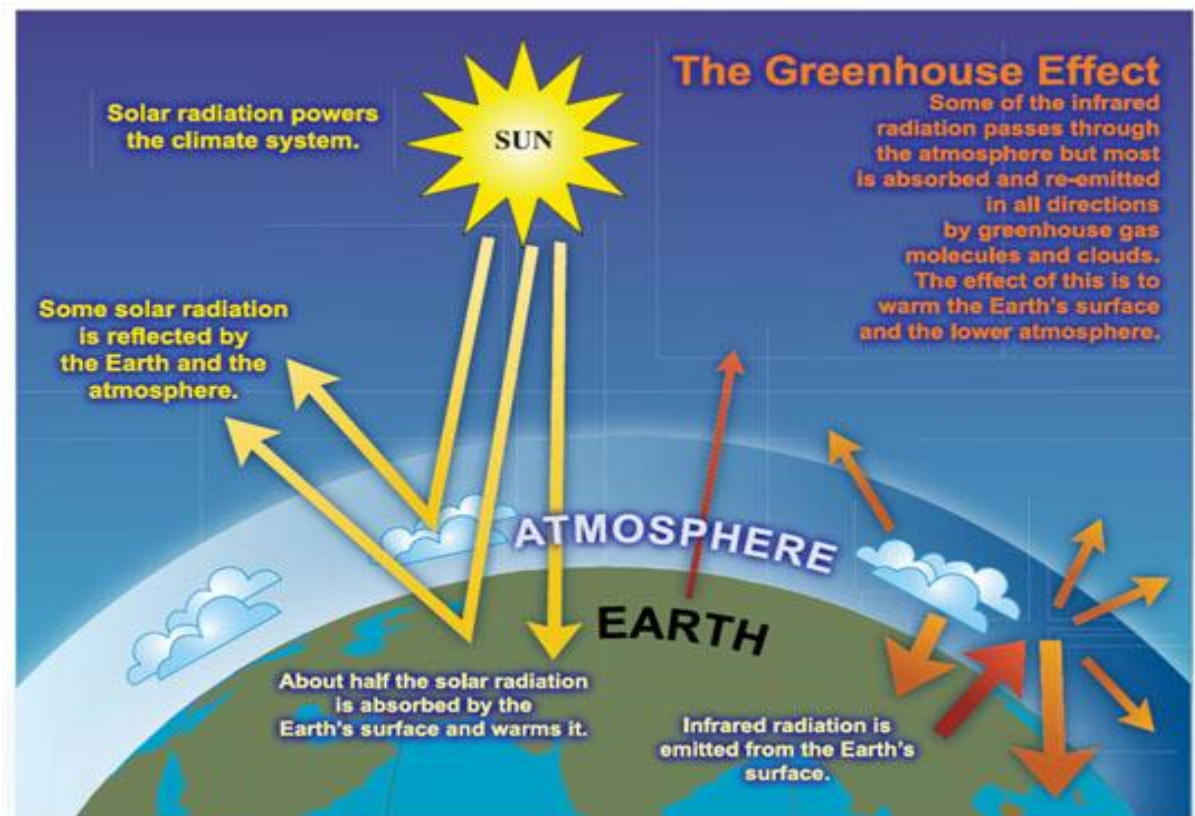
## 1.1 Climate Change

The Earth's climate has varied naturally throughout its history, with periods when it was much warmer than today and 'ice ages', when Scotland was under glaciers a kilometre deep. However, during these times the Earth was much less densely populated than it is today. As you are probably aware, the Earth is now going through another period of warming, but this is different from those that have happened in the past. Over the last century global temperatures have been rising and scientists have concluded that this recent warming cannot simply be explained as natural variability. Human activities, mainly the emission of greenhouse gases (GHGs), are playing a major part. The main causes are the burning of fossil fuels (such as oil, coal and gas), and changes in land use, such as deforestation. As we increase emissions, the GHGs in the atmosphere also increase. This is resulting in an increase in global average temperatures, average sea level is rising, and snow and ice are melting at an alarming rate (IPCC, 2007). The Intergovernmental Panel on Climate Change has also concluded that most of the warming that has occurred since the mid-20<sup>th</sup> century is very likely due to man-made GHG emissions.

These GHG emissions are 'enhancing' the natural greenhouse effect. The greenhouse effect is a process which keeps the planet warm due to GHGs in the atmosphere trapping radiation from the sun, without it the Earth would be much colder, around -18°C. The best known GHG is carbon dioxide (CO<sub>2</sub>), but there are a number of others, including methane, nitrous oxide and water vapour. Put simply, adding GHGs to the atmosphere enhances the greenhouse effect and results in global warming.

The latest research conducted by experts at the Met Office suggests that if we (and others around the world) continue to operate on a 'business as usual' basis, then we could see an increase in the global average temperature of approximately 4°C before the end of the 21<sup>st</sup> century. In addition to the changes already mentioned, this increase in global temperature will bring with it major changes to weather patterns and an increasing frequency and intensity of extreme weather events such as hurricanes, heavy rainfall events and heat waves. Such a large and fast change in climate is dangerous and will have severe and costly impacts (Stern, 2007). For example, our ability to produce food around the world will decrease significantly, hundreds of millions of people will face water stress while millions of others will face flooding, and around a third of all species are likely to become extinct (IPCC, 2007).

### The Natural Greenhouse Effect



Source: Intergovernmental Panel on Climate Change Assessment Report 4 (2007)

Scotland, and the rest of the UK, will not be immune from the effects of climate change. Unless we seriously change our lifestyles to cut CO<sub>2</sub> emissions, average temperature increases of up to 3°C in the winter and 4°C in the summer are likely to be experienced by our grandchildren and great-grandchildren (Met Office, 2009). The related weather changes are likely to mean floods, droughts and dangerous heat waves, with a rise in heat-related deaths. In 2003, 37,000 people died as a result of a heat wave in Europe, over 2,000 of which were in the UK (Met Office, 2009). Winters will be significantly wetter, with more intense rainfall. This would mean more flash floods, with rivers bursting their banks more often. Other impacts include an increasing incidence of severe gales and sea level rise affecting coastal areas, causing flooding of coastal homes and businesses and coastal erosion.

Action now needs to be taken to reduce GHG emissions to ensure that global temperatures do not rise by more than 2°C; this will help to limit the most severe impacts of climate change. This challenge has been accepted by the UK and Scottish governments with the passing of The Climate Change Act 2008 and The Climate Change (Scotland) Act 2009, both of which set a legally binding target to reduce emissions by 80% from 1990 levels by 2050. In Scotland, the first interim target is a reduction of 42% below 1990 levels by 2020. As a result, we will see an increasing regulatory requirement to reduce emissions in both the workplace and the home. Everyone has to play their part in the drive to a more resource efficient, low carbon system if we are to meet these targets and avoid catastrophic interference with the climate system.

Due to the global recession, it is likely that global emissions have fallen due to a reduction in fossil fuel use. The Earth's climate is also going through a natural cooling period, hiding the true extent of climate change for a short period. This may make it seem like we have turned a corner

and that the problem has been solved. This will not be the case. Tackling the global climate will be a major project for the whole of humanity and throughout the lives of everyone at the college. We need to do all we can to reduce our GHG emissions by using fewer fossil fuels, more renewable energy and changing our lifestyles to reflect this. Climate change is coming, but with your help, we can reduce its impacts for ourselves and the generations which follow us.

## 1.2 Sustainable Development

Climate change will affect us all, and is impacted by our current economic model which is reliant upon the use of fossil fuels for continual economic growth. However, people around the world are increasingly recognising that current economic development trends are not sustainable and that there is an alternative model which is sustainable development. Sustainable development is a difficult concept to define, and as it is continually evolving, this makes it even more difficult to define. One of the original descriptions and arguably the most famous was coined by the Brundtland Commission and states that,

*‘Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs’  
(WCED, 1987).*



With sustainable development the economy is not considered alone but in conjunction with society and the environment. All three aspects are considered to be just as important as each other therefore if the three aspects of sustainable development are considered as three circles of the same size, the overlap in the centre is where human well-being is achieved. As the three

elements of society, environment and economy become more aligned, the area of overlap will increase and so will human well-being.

In order to move towards sustainability, public awareness, education and training are required, which is the purpose of this range of workbooks. Whilst it is acknowledged that education is one of the key drivers to moving society towards global sustainability, the difficulty in defining sustainable development and whether it is achievable or not, continues to hamper progress. Different cultures have different visions of what a sustainable community will look like and how it will function. The lack of agreed definition and vision has made efforts to implement education for sustainable development (ESD) very challenging.

### 1.3 Education for Sustainable Development

We are well over halfway through the United Nations Decade for Education for Sustainable Development (UNDESD) which began on 1 January 2005. The UNDESD is a global initiative that recognises the vital role that education has to play in the transition to achieve societal change that motivates all generations to develop a sustainable future (UNESCO, 2004). The overarching goal of the UNDESD is to 'integrate the principles, values and practices of sustainable development into all aspects of education and learning, and all areas of life including communities, the workplace and society in general' (UNESCO, 2004). The Scottish Executive stated Scotland's response to the UNDESD by publishing the '*Learning for our Future*' action plan which advised what it wanted to achieve in the first five years of the UNDESD. An important aim of '*Learning for our Future*' was by 2014 to give people the 'knowledge, understanding, skills and values to live sustainable lives by fully integrating sustainable development into all stages of the formal education system' (Scottish Executive, 2006). Five years on the Scottish Government published '*Learning for Change*', Scotland's action plan for the Second Half of the UNDESD which reviewed the original plans to consider progress made to date, and also advised the actions required for the second half of the UNDESD. The Scottish Government announced progress made in the education sector taking into account climate change targets where they praised the progress made to date in the further education sector but highlighted the need to further embed ESD within all curriculum areas.

The concept of using education to achieve sustainability through a just and ecological society is not a new one. Schumacher (1973) acknowledged education as the 'greatest resource' we have at our disposal for attaining a paradigm shift to a sustainable way of life. The World Conservation Strategy also stated 'a new ethic, embracing plants and animals as well as humans is required for human societies to live in harmony with the natural world' and 'the long-term task of environmental education is to foster attitudes compatible with this new ethic' (IUCN, UNEP & WWF, 1980). Although this brought the term sustainable development to the public arena, it aimed to achieve it through conservation and was therefore limited to ecological sustainability and did not link sustainability to wider social and economic issues (Baker, 2006, p18).

It was not until the Brundtland Report that social, economic and ecological aspects of development were explicitly considered together (WCED, 1987). The Brundtland Report also argued that 'teachers had a crucial role to play in helping to bring about the extensive social changes necessary for sustainable development' (WCED, 1987). In 1992 the United Nations Conference on Environment and Development produced Agenda 21, a comprehensive document

which committed countries to promoting environmental sustainability through practice. This included education and community based projects at a local level highlighted by Local Agenda 21.

The first difficulty to overcome prior to evaluating or implementing ESD is determining exactly what it means. It was first defined by Chapter 36 of Agenda 21 which identified four major components of ESD which are, to improve basic education, reorient existing education to address sustainable development, develop public understanding and awareness and training (UNDESA, 1992). However, definitions vary and attempting to establish an agreed definition of ESD still causes considerable academic debate which means it remains a contested phrase (Jones *et al.* 2008). One definition is that 'ESD should be presented as 'coping with' rather than definitively 'solving' the 'ecological crisis' (Barry, 2007). However, this suggests we should adapt to the ecological crisis we are enforcing upon the Earth because it is inevitable, rather than change our behaviour to lessen our impact and avoid ecological crisis. ESD has many definitions, but this workbook encompasses the view that 'sustainable development education is the process of acquiring the knowledge, skills and attitudes needed to build local and global societies that are just, equitable and living within the environmental limits of our planet, both now and in the future' (SDE, 2008). Definitional conflict about all aspects of sustainability is nothing new, and there is still conflict today in understanding the term sustainable development, as it appears to 'bring into harmony two politically attractive but potentially conflicting notions' which is difficult to reconcile (Bonnett, 1999). If sustainable development still cannot be defined easily it is not surprising that neither can ESD.

There is definitely scope for further research into the Scottish College system to establish best practice for incorporating ESD within the curriculum at all levels in Scotland's Colleges. Dumfries and Galloway College has taken a major step forward in embedding ESD within the curriculum by implementing this project to produce a range of workbooks across the curriculum. However, to be effective it has been acknowledged that staff engagement is vital.

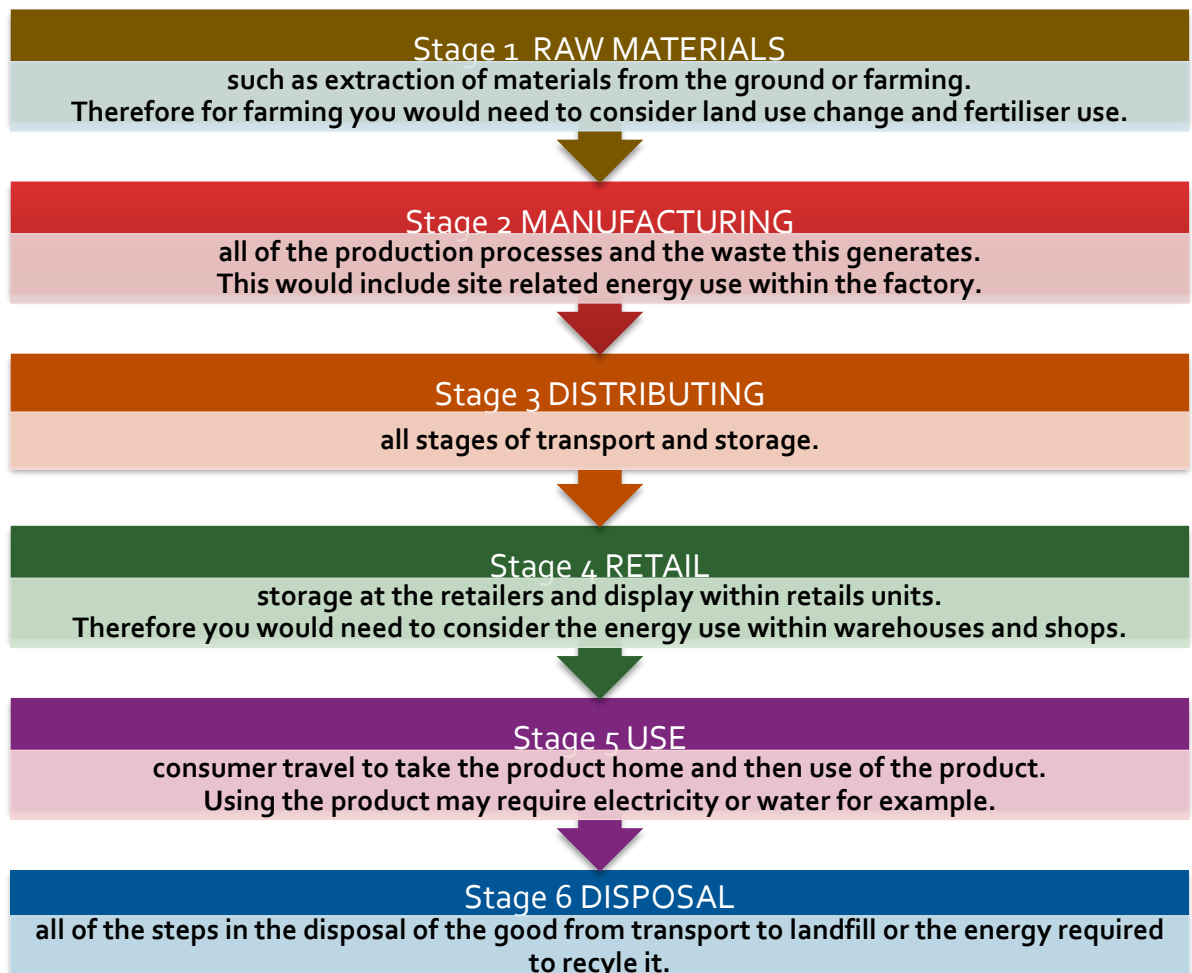
The chapters that follow aim to provide some of the information required for staff and students to make informed choices about living their lives in a more sustainable fashion.

## 2 THE LIFE CYCLE OF EVERYDAY OBJECTS

Life Cycle Analysis (LCA) is a process used to measure the environmental impact of a product or process, from the beginning of its life to the end, or from the 'cradle to grave'. As we can see from the diagram below, to make any product we need to start with the raw materials and then determine how they are processed to make the product, how the product is then used, before it is either discarded or recycled.



Source: Adapted from the Swedish Environmental Management Council





Think about what everyday objects are made of, the resources and energy used to make them, how long they can be used for, and what happens to them at the end of their useful life. You may also need to consider the following:

- Different types of products and services have their most significant climate impact at different stages in their life cycles.
- For products with a long life and high energy consumption, the use phase typically accounts for the most significant climate impact, for example a washing machine.
- Other products will have their greatest impact during the production phase – this is usually the case for food production.
- Some products may not be recyclable and may need to go to landfill.

This is just a small snapshot of the impacts of the life cycle of an object. To see more about the environmental impacts of the products we consume, go to <http://storyofstuff.org/> and watch the Story of Stuff.

## 2.1 The Life Cycle of a Paper Clip

Pictured below is a paper clip, it looks like a very simple object to produce. Have a good look at the picture and think about the following questions and the answers provided. The answers are not definitive but are provided to start you thinking about the life cycle process of an object.

**Q1** What are paper clips made from? Where does this material come from?

- *Usually steel but sometimes plastic.*
- *Steel is made from iron ore which is extracted from the ground by mining.*
- *There are environmental consequences of mining.*
- *Iron ore is not renewable.*



Image: Sura Nualpradid / FreeDigitalPhotos.net

**Q2** How are they made? What energy is used to make them?

- *Have to be manufactured from raw materials.*
- *How energy intensive is it, also how water intensive?*
- *What about pollution?*

**Q3** Once made, how do the paper clips get to the distributors that sell them?

- *Transport at all stages produces GHG emissions, from extraction to processing, distribution and then consumer transporting.*

**Q4** How long are they used for?

- *They should last a long time.*
- *Using them does not produce any GHG emissions.*



**Q5** What happens to paper clips once their useful life is over?

- *Would you recycle it or put it in the bin?*
- *If you wanted to recycle would you know where to put a paper clip to recycle it?*
- *Even if recycled, because of the laws of thermodynamics, less than 100% of the material is recoverable.*

**Q6** Can you think of other environmental impacts of a paper clip?

- *What about the paper clips made from coloured metals or with the coloured plastic coatings? This introduces other material such as dyes and plastics.*

### 3 CARBON FOOTPRINTS

In the previous section the environmental impact of making things was considered. In our everyday lives we use hundreds of different products, all of which have an environmental impact throughout their lifetime. Producers of goods and services are increasingly becoming aware of these impacts and are starting to think of measures they can use to limit the amount of environmental damage their product is responsible for. One method of measuring this impact is carbon footprinting. A carbon footprint is the total set of greenhouse gas (GHG) emissions caused by an organisation, event or product (UK Carbon Trust, 2009). To make it easier to report, it is often expressed in terms of the amount of [carbon dioxide](#), or the amount of carbon dioxide equivalent of any other GHGs emitted.

A product's carbon footprint is the total amount of GHGs produced across its life cycle from extraction to recycling or disposal. To measure a product footprint there is a 'basket of six' GHGs that are measured, these are:

- Carbon dioxide (CO<sub>2</sub>)
- Nitrous oxide (N<sub>2</sub>O)
- Methane (CH<sub>4</sub>)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF<sub>6</sub>)

Many producers are now starting to measure the carbon footprint of the goods they produce. If a producer or manufacturer wants to reduce the carbon footprint of a product or services it needs to know how big it is first. Below is an example of carbon footprint information for a brand of washing powder.



850g CO<sub>2</sub> per  
wash

Image: digitalart / FreeDigitalPhotos.net

The carbon footprint of this product is 850g per wash. This can be reduced by washing at a lower temperature. Washing at 30°C instead of 40°C saves 160g CO<sub>2</sub> per wash.

When measuring a carbon footprint, it is important to explain what the amount of carbon measured relates to, or to provide a meaningful unit. In this example the carbon footprint of 850g CO<sub>2</sub> is the amount per washing machine load.

This example refers to the amount of CO<sub>2</sub>, 294g, per bottle of mangoes and passion fruits smoothie.



Image: By permission from Innocent Smoothies

The main benefits of calculating a product footprint are to identify savings, both in terms of money and for reducing carbon emissions. Also as customer demand grows for more 'eco-friendly' products it can be used to advertise your green credentials. If customer demand is sufficient this puts pressure on producers and suppliers to think about the environmental impact of their products.

The internet is a useful tool for finding information on the carbon footprint of products. A good place to start is the Carbon Trust website at [www.carbontrust.co.uk](http://www.carbontrust.co.uk) and then search for product footprint information. Carbon footprinting can also be used to measure the GHG emissions from an event such as a conference or a festival.

### 3.1 Your Carbon Footprint

It is not only organisations, products and events that have carbon footprints. Activities in our daily lives cause GHG emissions and we can measure the amount to determine our own individual carbon footprint, just as we considered product carbon footprints previously.

The areas of our lives that generate most of our individual GHG emissions are as a result of:

- Electricity use
- Travel and transport
- Food production
- Buildings we use
- Waste

Carbon footprints are a sub-section of ecological footprints. Ecological footprints look to measure one person's impact upon the world, or the amount of resources or space that are required for an individual to live their life. Go to the following website, <http://footprint.wwf.org.uk/> and enter the data to reflect your lifestyle, it will only take a few minutes to do so. Based on the information you provide regarding the way you live; the calculator will estimate how many planets would be required to support your lifestyle should every person in the world live as you do. This is based on the amount of land required to produce the quantity of resources that you consume.

- ▶ Record here how many planets your lifestyle requires \_\_\_\_\_
- ▶ Record here your carbon footprint \_\_\_\_\_ tonnes per annum

***You may be surprised by the results!***

*Remember we only have one Earth!*

**Available Resource = 1 Planet Only!**



Image: Salvatore Vuono / FreeDigitalPhotos.net

### **Guidance for 3.1 Your Carbon Footprint**

*The number of planets your lifestyle requires, or your 'ecological footprint' will be calculated based on your lifestyle, so your answer will be different to that of your colleagues or students. This also applies to the number of tonnes of carbon your lifestyle generates.*

*This exercise can be used to generate discussion as to why your lifestyle produces different figures from someone else's. Does one of you fly more than the other, does someone use more public transport instead of a personal car, and maybe someone grows their own food and only buys organic, seasonal produce wherever possible, whereas someone else buys all pre-packaged processed food. The amount of 'stuff' you consume will also affect the numbers, as will the size of house you live in and how you use energy in it.*

*This exercise is a good way to compare and contrast lifestyles of different people around the world, looking at those who live within the confines of one planet and those who don't. It can be used to debate the social injustice of those who have and those who don't. This would also be a good opportunity to look at the United Nations Millennium Development Goals.*

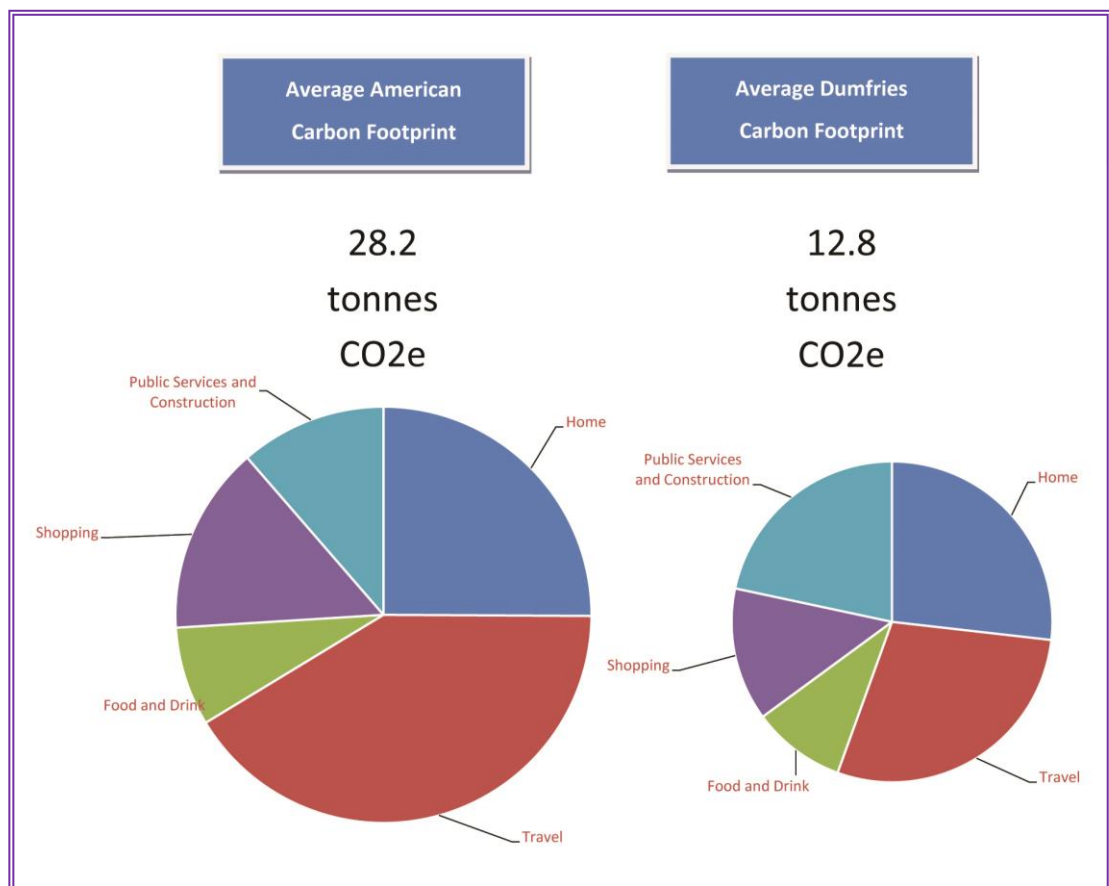
## **3.2 Carbon Footprints around the World**

Not everyone in the world lives in the same way as many of us in Scotland and other industrialised countries do. Some people are more environmentally aware and try to limit their impact upon the Earth and its resources wherever possible, whilst others don't. Also, not everyone has access to the same amount of the Earth's resources or the means to live as we do in the western world. The diagram below shows the average carbon footprint of the average North American in tonnes of carbon dioxide equivalent, (this is the total GHG emissions from the

'basket of 6' GHGs) which is compared against the average carbon footprint of someone who lives in Dumfries.

**REMINDER: 'basket of six' greenhouse gases:**

- Carbon dioxide (CO<sub>2</sub>)
- Nitrous oxide (N<sub>2</sub>O)
- Methane (CH<sub>4</sub>)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF<sub>6</sub>)



*Source: Carbon footprint tool developed by the Crichton Carbon Centre*

In 2009 the average North American had a carbon footprint of just over 28 tonnes of carbon dioxide equivalent and the average carbon footprint in Dumfries was nearly 13 tonnes of carbon dioxide equivalent. Whilst the carbon footprint of the average person in Dumfries is significantly lower than the average North American; we are still not living within the available resources on the Earth if everyone were to have the same share. Ecological footprints measure the amount of hectares of land that are required to provide all of the goods and services a person consumes. To put this into perspective, the average North American person needs 8 hectares of land to support their lifestyle, the average British person needs 4.9 and the average Indian person only uses 0.9

hectares of land (Global Footprint Network, 2010). This highlights the social injustice that exists between different lifestyles around the world.

Put simply if everyone in the world lived like the average North American we would need five planets, that's four more in addition to the one we already have! Unfortunately, we do not have five Earths!



*Image: Idea go / FreeDigitalPhotos.net*

At the other end of the scale, the average person in China has a carbon footprint of 5 tonnes of carbon dioxide equivalent and in Bangladesh the average is as low as 1 tonne of carbon dioxide equivalent (Clark *et al*, 2009).

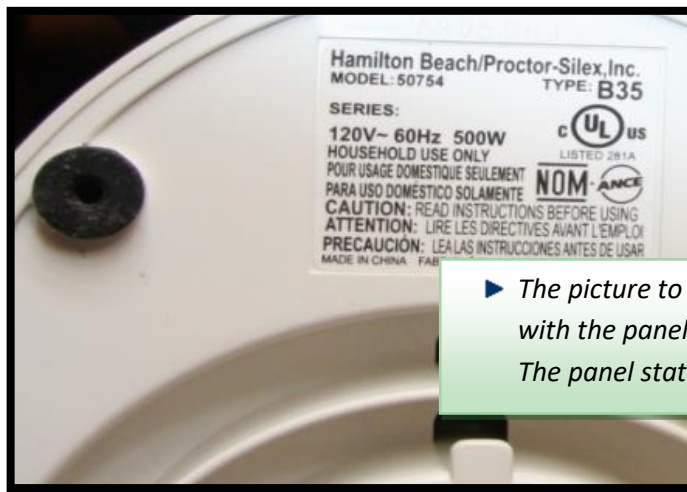
We will now move on to look at the areas of our lives that generate the majority of our GHG emissions.

## 4 CALCULATING ENERGY CONSUMPTION

### 4.1 Electricity – Understanding Watts and Kilowatt Hours

We calculate electricity in units of kilowatt hours (kWh). In the same way that 1 kilometre = 1000 metres; 1 kilowatt hour = 1000 watt hours.

When we look at anything that runs on electricity, such as a hairdryer or a television, there is usually a label that tells us how energy hungry it is - this is the number of watts (W) the piece of equipment uses – or its 'wattage'. See the example below:



► The picture to the left shows a household food blender with the panel you are looking for.  
The panel states the wattage of the blender is 500 watts.

Before calculating how much energy is used by electrical appliances in our home, we will look at a simple example of electricity consumption using light bulbs in a college classroom.

#### STAGE 1

If there are 8 light bulbs in a classroom and each light bulb is 100 W, then to find out the total wattage of the lights you need to multiply the number of bulbs by the wattage:

$$\text{Total wattage (8 bulbs)} = 8 \times 100 \text{ W} = 800 \text{ W}$$

#### STAGE 2

To work out the 'watt hours' (Wh), we need to know the wattage **and** the number of hours it is turned on for.

$$\text{Watts} \times \text{hours} = \text{watt hours}$$

#### STAGE 3

Then to find out how many kilowatt hours this is, we divide the number of watt hours by 1000:

$$\text{Watt hours} \div 1000 = \text{kilowatt hours}$$

For example, if the eight 100 watt bulbs in the classroom are turned on for 5 hours, then:

$$800 \text{ watts} \times 5 \text{ hours} = 4000 \text{ watt hours}$$

$$4000 \text{ watt hours} \div 1000 = 4 \text{ kilowatt hours}$$

To calculate how much energy the classroom uses for lighting in a year, we need to estimate how many hours the lights are turned on for in a year. To do this we need to estimate the number of hours they are on per day, the number of days they are on per week, and the number of weeks per year.

The classroom lights are usually on for 8 hours per day, there are 5 days in the college week, and 40 college weeks per year, so the classroom lights are on for:

$$[8 \text{ hours/day} \times 5 \text{ days/week} \times 40 \text{ weeks/year} = 1600 \text{ hours/year}]$$

And the energy they use in a year is:

$$800 \text{ watts} \times 1600 \text{ hours/year} = 1,280,000 \text{ watt hours/year}$$

$$1,280,000 \text{ watt hours/year} \div 1000 = 1280 \text{ kilowatt hours/year (kWh/yr)}$$

$$\text{Based on an average electricity unit price of } \pounds 0.10, 1 \text{ kWh costs } \pounds 0.10$$

$$\text{Therefore } 1280 \text{ kWh/yr costs } 1280 \times \pounds 0.10 = \pounds 128.00$$

## 4.2 Changing Light Bulbs

The previous example used 100 watt bulbs in the classrooms; however, the college uses low energy fluorescent lighting in the classrooms. Each light fitting contains two 35 watt bulbs, and there are 11 fluorescent lights in the classroom. Prior to moving into the new college building, we will assume the old college building used light fittings with 100 watt bulbs, and there were 15 of these bulbs in a classroom. Using this information, we can calculate how much energy and money the college saved when they moved to the new building by using lower wattage bulbs in the classrooms. Complete the following table to finish this calculation.

**HINT:** Estimate how many hours the lights are on each day based on an eight hour day. Remember there are 5 college days in a week, and 40 college weeks in a year, so there are 200 college days in a year.

**REMEMBER:** (watts x hours per year)  $\div$  1000 = kilowatt hours per year  
(Answers are provided in red)



	Wattage of 1 bulb [W]	Number of bulbs	Total watts of all bulbs [W]	Hours on per day [hours / day]	Hours on per year [hours / year]	Kilowatt hours of energy per year [kWh / year]
<b>OLD BULBS</b>	100	15	$100W \times 15$ bulbs = <b>1500 watts</b>	8	$8 \text{ hours} \times 200$ days = <b>1600 hours</b>	$1500 \text{ watts} \times 1600$ hours = $2,400,000 \text{ watt hours} \div 1000 =$ <b>2400 kWh / year</b>
<b>NEW BULBS</b>	35	22	$35W \times 22$ bulbs = <b>770 watts</b>	8	$8 \text{ hours} \times 200$ days = <b>1600 hours</b>	$770 \text{ watts} \times 1600$ hours = $1,232,000 \text{ watt hours} \div 1000 =$ <b>1232 kWh / year</b>
		<b>SAVINGS</b>	$1500 - 770 =$ <b>730 watts</b>			<b>SAVINGS</b> $2400 - 1232 =$ <b>1168 kWh / year</b>

**Q1** Therefore how many kWh of electricity have been saved in a year in classroom by changing the bulbs? = **1168 kWh / year**

**REMEMBER:** the average cost of 1 unit of electricity costs the college £0.10

1kWh of electricity costs **£0.10**

Therefore a reduction in use of **1168kWh** saves  **$1168 \times £0.10 = £116.80$  year**

**Q2** The new college building has many classrooms, therefore how much electricity and money has the college saved by changing the light bulbs in 20 classrooms?

One classroom means a reduction of **1168 kWh / year**, so 20 classrooms means a reduction of  **$1168 \times 20 = 23,360 \text{ kWh / year}$**

One classroom saved **£116.80 a year**, so 20 classrooms saves  **$£116.80 \times 20 = £2336.00$  a year**

### 4.3 Energy Use at Home

The calculations used for the light bulbs in the college classrooms, can be applied to the electrical equipment we use in our homes. Look around your home and choose five pieces of electrical equipment you can find the wattage easily for. Remember, this can be found for many items on a little panel on it, failing that you can find the wattage in the manufacturer's guide, if you still have it, or by searching on the internet (a good site is [www.sust-it.net](http://www.sust-it.net)).

The items can be anything electrical, for example, a television, kettle, microwave, or even something you only use occasionally such as an electric lawnmower.

**Hint:** Once you have selected your electrical equipment, make an estimate of how many hours a day on average it is switched on and then complete the following table. The first line has been completed as an example.

**REMEMBER:** *there are 365 days in a year*

Type of equipment	Make and model	Wattage [W]	Hours of use per day [hours / day]	Hours of use per year [hours / year]	Kilowatt hours of energy per year [kWh/year]
Television	Sony KDL 32EX603 32"	80	5	$5 \times 365 = 1825$ hours / year	$80\text{W} \times 1825 \text{ hours} = 146,000 \text{ watt hours} \div 1000 = 146 \text{ kWh/year}$

- Q1** What is the most energy intensive piece of equipment you found? Remember this is the piece of equipment with the highest wattage per hour.
- Q2** Which piece of equipment you looked at in your household consumes the most electricity per year?
- Q3** Were you surprised by any particular result? If so, for what piece of equipment and why were the results surprising?
- Q4** Can you think of an example of an electrical item that you could substitute manpower for and still achieve the same result?
- Q5** What room in your house do you think is the most energy intensive in terms of electricity? Why do you think this is?
- Q6** Take the piece of equipment with the highest wattage per hour and search the internet for a less energy intensive alternative. Record your findings.

### **Guidance for 4.3 Energy Use at Home**

*There are no right or wrong answers for this exercise. The aim of this exercise is to raise awareness of energy use in the home; following on from looking at light bulbs in the college and the money that could be saved from making small changes such as switching to a lower wattage bulb. This can help you consider if there are changes you can make to the equipment you use at home to be more energy efficient. This doesn't mean replacing equipment in perfectly good working order for more energy efficient models, if the equipment you are replacing ends up in landfill, but when the item does need replaced, consider replacing it with a model that uses less energy. Being aware of how much energy a piece of equipment uses and how much it costs to use it will hopefully make you think about your energy use. Consider if you really need to switch it on and if so, don't leave it on standby, wasting energy and money when not in use.*

## 5 TRAVEL AND TRANSPORT

Transport and travel make up a large part of our carbon footprints. Much of this can be attributed to the use of the motor car as this has become the most popular and convenient way for many of us to travel. The car is often seen as a 'status symbol' and for many 17 year olds, obtaining a driving licence and owning a car is considered a natural part of becoming an adult.

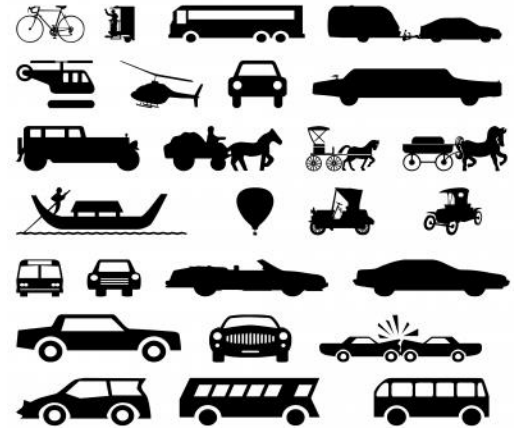


Image: xedos4 / FreeDigitalPhotos.net

Below are details of the emissions for different car sizes, petrol and diesel, for a **10 mile journey**.

Size of car and fuel used	Total GHG emissions (kg CO <sub>2</sub> eq) / 10 mile journey
Small <b>PETROL</b> car, up to 1.4 litre engine	2.9 kg CO <sub>2</sub> eq
Medium <b>PETROL</b> car, from 1.4 – 2.0 litre engine	3.5 kg CO <sub>2</sub> eq
Large <b>PETROL</b> car, above 2.0 litres	4.8 kg CO <sub>2</sub> eq
Small <b>DIESEL</b> car, up to 1.7 litre engine	2.5 kg CO <sub>2</sub> eq
Medium <b>DIESEL</b> car, from 1.7 – 2.0 litre engine	3.0 kg CO <sub>2</sub> eq
Large <b>DIESEL</b> car, above 2.0 litres	4.1 kg CO <sub>2</sub> eq

Total greenhouse gas emissions are advised in kg of carbon dioxide equivalent (kg CO<sub>2</sub>eq); this includes all emissions from the 'basket of six' greenhouse gases that were introduced earlier.

**REMINDER** 'basket of six' greenhouse gases:

- Carbon dioxide (CO<sub>2</sub>)
- Nitrous oxide (N<sub>2</sub>O)
- Methane (CH<sub>4</sub>)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF<sub>6</sub>)

If you travel 100 miles a week in your car, from the table above it is easy to see how the emissions start to add up throughout the year. Let's compare the annual emissions from a small petrol car against a large diesel car that drives on average 100 miles a week.

<b>SMALL PETROL CAR</b>	up to 1.4 litre engine – <b>2.9 kg CO<sub>2</sub>eq</b> for 10 miles $2.9 \times 10 =$ <b>29 kg CO<sub>2</sub>eq</b> for 100 miles in a week $29 \times 52 =$ <b>1,508 kg CO<sub>2</sub>eq</b> for 5,200 miles in a year
<b>LARGE DIESEL CAR</b>	above 2.0 litres – <b>4.1 kg CO<sub>2</sub>eq</b> for 10 miles $4.1 \times 10 =$ <b>41 kg CO<sub>2</sub>eq</b> for 100 miles in a week $41 \times 52 =$ <b>2,132 kg CO<sub>2</sub>eq</b> for 5,200 miles in a year

So the difference between driving a small petrol car 100 miles a week over a year and a large diesel car 100 miles a week over a year is **624 kg CO<sub>2</sub>eq**

To put this into perspective this is roughly equivalent to a long haul economy flight to India.

## 5.1 Lifestyle Changes Relating to Travel

Think of your lifestyle and look at the following table advising where you could make changes to reduce the GHGs you generate from travel. Also think about the barriers which may make it difficult for you to implement these changes and try to think of solutions to overcome the barriers. Some examples have been provided for you, these examples are not exhaustive and you will be able to think of many more.

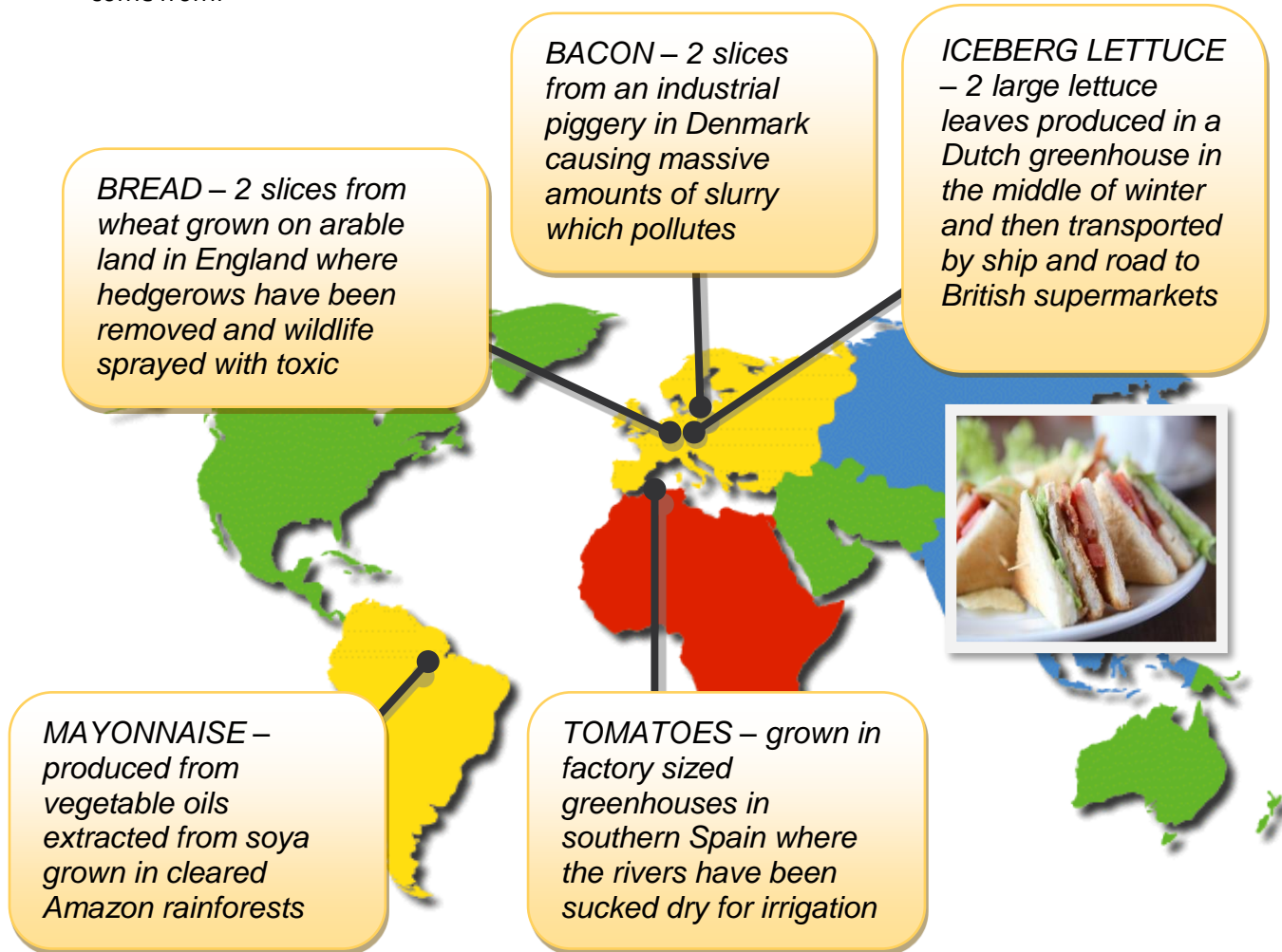
Lifestyle Change	Barrier/Solution
I will use public transport to travel to work instead of my car.	<p><b>Barrier</b> – the bus timetable does not get me to work on time.</p> <p><b>Solution</b> – my employer has agreed that twice a week I can start and finish earlier, fitting my hours in with the bus timetable.</p>
I will not fly abroad on holiday any more.	<p><b>Barrier</b> – I want a holiday in the sunshine and it rains all the time in Scotland.</p> <p><b>Solution</b> – take the ferry to the South of France instead, or consider Cornwall which is sunnier than Scotland. It is easy to travel to France and Cornwall by other means of transport rather than flying.</p>
I will buy a car with a smaller engine that has lower greenhouse gas emissions.	<p><b>Barrier</b> – I can't afford to replace my car.</p> <p><b>Solution</b> – thinking sustainably should not mean replacing perfectly good equipment. However, when you do need to and can afford to replace your car, consider a lower emission alternative.</p>

It may not always be possible to implement a positive solution to the barrier, for example your employer may not allow you to work different hours two days a week. However, until you consider the barrier and look for a solution you will never know if a lifestyle change could be possible.

## 6 FOOD

It should already be evident to you from calculating your carbon footprint that one of the major contributors to our ecological and carbon footprint is the food we consume, but why is this? The easiest way to explain it is to look at an example of an everyday snack or lunch we may enjoy.

Taking a bacon, lettuce and tomato sandwich as an example, where do all of the ingredients come from?



Source: Adapted from the Teachers pack School Global Footprints (WWF Scotland, 2006). Image: piyato / FreeDigitalPhotos.net

We can see from the example above, just how far our food often travels before it ends up on our plate. In the last section on transport, we calculated the amount of greenhouse gas emissions that resulted from different forms of travel. Therefore, it should be evident that if we were to consume less food grown in other countries and transported to the UK, and eat more food produced in the UK, this would reduce our carbon footprint in relation to food consumption. However, it is not always this straightforward. What would we do if we wanted fresh strawberries in January or pineapple at any time? Should we only eat seasonal fruit and vegetables that can be grown in the UK without the need for energy intensive hot houses?

## 6.1 Environmental Impact of Food

As we have seen, everything we eat has an impact upon the environment however there are steps we can take to help reduce the environmental impact of food, including the following:

- Shop locally and if possible leave the car at home.
- Plan one big trip if using a large supermarket instead of going two or more times per week.
- Buy locally grown produce when it is in season.
- Avoid food which is over packaged whenever possible.
- Buy organic produce.
- Buy fair-trade goods which support third world communities and are usually transported by sea.

## 6.2 Fairtrade

Fairtrade has gained in popularity over recent years in our shops and supermarkets, especially with items such as tea, coffee, cocoa, chocolate and bananas. The purpose of Fairtrade is to provide justice and equality for small independent producers and the workers on plantations. The plantations are located in developing countries where workers are often exploited. In the past many of these farmers and workers were paid low wages and forced to work in poor conditions meaning they had to live in poverty. All of this meant they had little opportunity to improve their situation. Fairtrade aims to reverse this trend by ensuring there are standards in place for working conditions, and by implementing prices for traders and consumers. This means the farmers and workers are paid a fair wage. Fairtrade also ensures that the welfare conditions for the workers are acceptable, that children are not employed who should be in school and that farming practices are sustainable.

When we think of Fairtrade products, some of the first things that spring to mind include tea and coffee, or chocolate and bananas, none of which grow in the UK. Therefore, sometimes we need to think about compromising one belief or value we have, to support another. In this case the carbon emissions to transport these goods around the world, versus the need to help communities in developing countries support themselves and receive a fair income.

There may be other areas apart from Fairtrade where you may choose to compromise; especially in terms of the money you have available to spend, in order to support an environmental belief. For example, it is more expensive to buy free range chicken than battery farmed, which means you may choose to eat the more expensive free range chicken once a week instead of the cheaper alternative more often. Another example is looking for tuna that is pole and line caught which is more expensive than standard tins of tuna which have been caught by a process called purse seining. This involves huge nets which catch everything in the marine environment, including sharks and turtles (and sometimes even dolphins, although they state on the tin they are 'dolphin friendly'). These other species are then discarded as by-catch and thrown back into the sea dead.



### 6.3 Environmental Impacts of Food Production

Decide what your favourite meal is, whether this is a burger, a curry, or fish and chips, and think about what the environmental implications could be of producing that meal. Use the internet to search for the implications of the ingredients within the meal. Think about where and how the ingredients are grown and how they reach the supplier you have purchased them from.



Image: savit keawtavee / FreeDigitalPhotos

My favourite meal is

---

The ingredients include:



Record here what you think some of the environmental impacts of your meal could be

- 
- 
- 

#### **Guidance for 6.3 Environmental Impacts of Food Production**

*There are many different environmental impacts that could be highlighted in this exercise; here are just a few examples:*

- *Has the food been sourced sustainably, for example is fish from a sustainable fishery?*
- *Have any of the ingredients been flown to the UK, if so why? Are they ingredients not grown in the UK, or are they not in season in the UK?*
- *Are any of the ingredients Fair Trade?*
- *Are the ingredients organic?*
- *Are there any animal welfare issues, such as free range or battery chicken or eggs? Are there any animal ingredients from countries outside the UK where animal welfare rules are different?*

## 7 BUILDINGS

### Sydney at Night

Around half of all global GHG emissions are generated from buildings. During the useful life of a building, this includes emissions during construction, the electricity consumed within them and the energy required to heat them. Once we are finished with the building there are emissions associated with its demolition, with materials either being recycled, which uses energy, or sent to landfill, which has other environmental impacts also. As we have seen earlier this is emissions from the 'cradle to the grave' of the building. There is huge potential for energy reduction in buildings as they are responsible for 40% of energy consumption and 36% of European Union CO<sub>2</sub> emissions (European Commission, 2010).



*Image savit keawtavee / FreeDigitalPhotos.net*

Dumfries and Galloway College is a new building and has been designed and built to be energy efficient. However, this does not mean that improvements in energy reduction cannot be made because a building can be as energy efficient as possible, but if it is not used correctly then it will not be effective. For example, in the college a great number of the students use the disabled access doors at the main entrance instead of the revolving door. Constantly opening these doors makes the energy used for heating in this area inefficient. A campaign to educate the students why to use the revolving door could help to overcome this. This is why it is important not just to use the most energy efficient type of electrical equipment available, but also to ensure it is not left switched on unnecessarily. In a building such as a college, equipment like computers and printers are often left on standby consuming energy and costing money which could easily be saved. A simple measure such as placing stickers beside equipment reminding staff and students to switch it off once they have finished with it could help reduce this.



Outwith the college, in our homes and workplaces there are simple and inexpensive measures that can be implemented such as:

- Replacing light bulbs with lower wattage versions where possible.
- Switching appliances off at the plug socket to ensure they are not accidentally left on standby.
- Draught proofing doors and windows by using secondary glazing or fitting heavy lined curtains in the winter months.
- Placing special foil panels behind radiators to reflect more heat into the room.
- Redecorating with insulating paint.

There are other measures which require more time, effort and money such as:

- Replacing doors and windows with double or triple glazing.
- Ensuring there is adequate wall and roof insulation.
- Upgrading the boiler and heating system when they need replaced.
- Replacing electrical appliances with energy efficient rated models.
- Switching electricity suppliers to one that utilises renewable energy sources to generate electricity.



*Blacklaw Wind Farm, Lanark, Scotland - Image by: Author*

A lot of the inexpensive measures can help to save money in the long run by reducing your energy bills. Some of the more expensive measures such as fitting adequate insulation in your home may be eligible for a government grant to help with the cost, even where you own your own home, are under 70 and are not in receipt of any income related benefits. For details of eligibility check the Government Grant website at <http://www.government-grants.co.uk/>

### 7.1 Case Study – The Empire State Building

Whilst moving forward, new buildings can be designed and built to be energy efficient, however existing buildings also need to be considered. The Empire State Building in New York is in the process of a major refurbishment which aims to reduce the energy usage of the building by up to 38% by 2013. Using computer modelling, the building's energy efficiency was analysed to identify areas where the overall energy efficiency could be improved. The project team then decided to focus on eight economically viable measures which are expected to save around \$4.4 million a year in energy costs. These measures include:

- Refurbishment of the building's 6500 windows to create triple-glazed insulated panels
- Fitting insulation behind radiators to reduce heat loss
- Improved lighting and controls to reduce electricity usage
- Replacement of the building's air handling units to increase operational efficiency
- Introduction of demand control ventilation

*(Energy Efficiency News, 2009)*

Commercial and residential buildings account for the majority of the carbon footprint of major cities around the world, over 70% in New York. Therefore, finding a viable solution to retrofit existing major buildings to reduce their energy consumption and make cities cleaner and more energy efficient is vitally important.



*Image: Paul Martin  
Eldrige /  
FreeDigitalPhotos.net*

## 8 WASTE



There is a limit to the amount of waste the Earth can absorb. When we look at a product and the waste it generates, we need to look at it from the 'cradle to grave'. This is why we have looked at products so far starting with the raw materials they are made from and ending with the disposal of the item. In order to reduce the amount of waste we produce, we need to reduce the number of products we consume. We have more money to buy more 'stuff' and as we like new 'stuff' we are always buying more. Also, products are not made to last like they were in the past. Our grandparents would 'make do and mend' whilst we just throwaway and replace. Economies of countries are driven by producing and selling more materials, so to make products that last longer does not make economic sense.

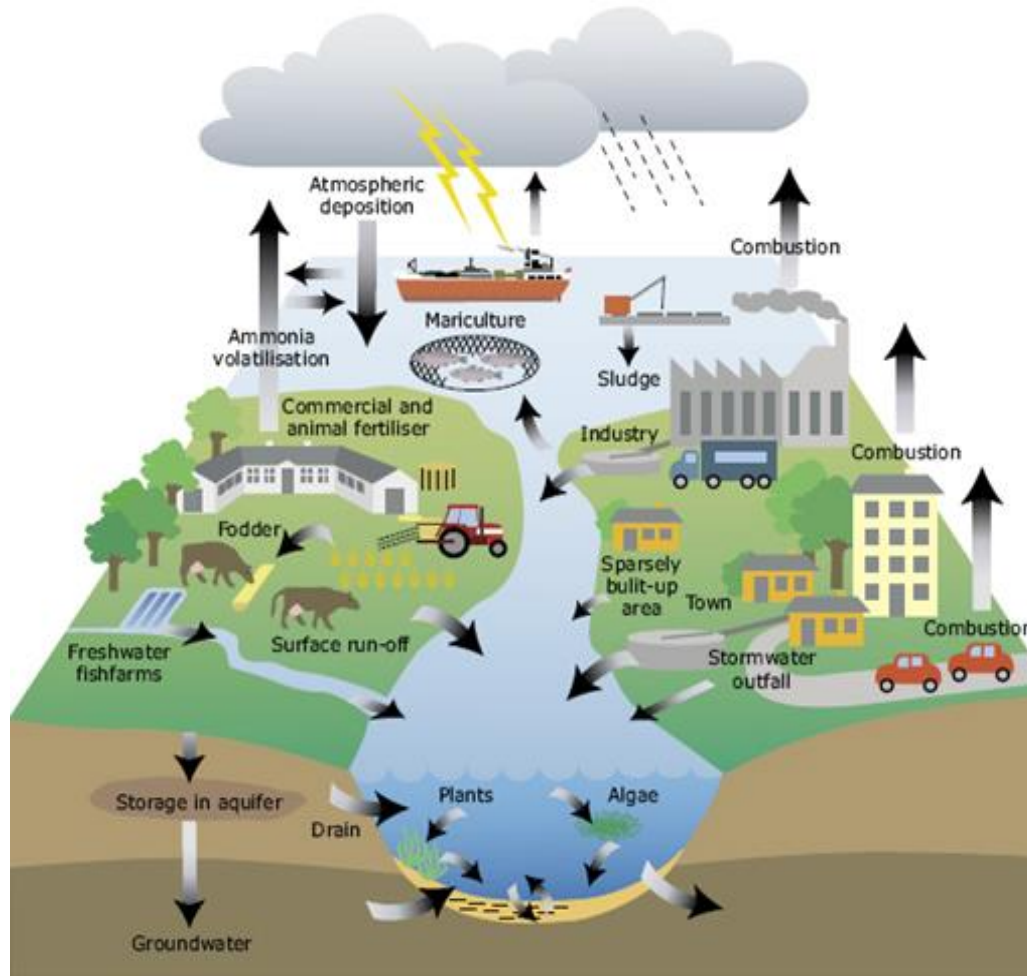
Packaging is a major source of waste. The minute we remove it from a product waste is produced. One way to reduce the amount of packaging is by consumers putting pressure on suppliers to not over package their goods. This may be difficult for an individual, however if you are responsible for purchasing products on a large scale for an employer or your own business, this may then become possible. It is also worth investigating if a supplier has an environmental policy and, if so, what it consists of, before deciding to use that supplier. As was established in the section on the life cycle analysis of a product, we should consider waste impacts from 'cradle to grave' for a product. If we produce and use less packaging, this means there are less raw materials required to make the packaging and less energy being used also. Less packaging also means less waste to recycle, which also uses energy, or less waste to send to landfill.

Some of the waste produced in the college, for example in the hair and beauty salons or the workshops, is not only a concern due to the disposal of packaging but also due to disposal of the chemicals used in the products. Chemical waste causes pollution, which can be either point source or non-point source. Point source pollution is usually defined as pollution where the origin can be defined from one source, such as at the end of a pipe. Non-point source pollution is caused indirectly by chemicals leaking into groundwater. If disposed of incorrectly, chemicals can cause pollution to our environment by leaching into our groundwater from landfill sites. This can have a negative long-term effect on human health and also impacts upon plants and animals.

*Here is an example of **point source pollution** or **end of pipe pollution**. It is generally easy to see and recognise point source pollution, which can make it easier to address.*



Image: dan / FreeDigitalPhotos.net



Source: <http://www.eea.europa.eu/themes/water/water-pollution>

**Non-point source pollution** can be more difficult to identify as it can originate from many sources.

In the picture above chemicals are leaching into groundwater from many different sources including farming, industry and towns.

However, attitudes towards waste in our society are slowly changing. The best way to minimise the amount of waste we produce is to reduce the amount we produce in the first place. Failing this the next best option is to re-use it wherever possible and if this is not possible then recycle it.



Most of you will probably be familiar with this concept already:

## REDUCE

the amount of waste we produce

*(For example by manufacturers using less packaging on products or by consumers buying re-fill packs which use less packaging. Consumers can also put pressure on manufacturers and retailers to use less packaging.)*

## RE-USE

packaging or waste wherever possible, either for the same purpose or find a new use for it

*(For example, save last year's Christmas cards and wrapping paper. Wrapping paper can be used again and Christmas cards can be cut up and used as name tags or decorations. Old magazines and newspapers can be used as wrapping paper with some pretty ribbon or bows added)*

## RECYCLE

break your waste down and reprocess it, however remember this uses further energy.

*(However, remember this uses further energy and some items cannot be recycled because of toxic chemicals in them or because they may have been manufactured from different materials squashed together).*

***So most of us are familiar with the message REDUCE, RE-USE, RECYCLE. However, this can also be added to.***

## REPAIR

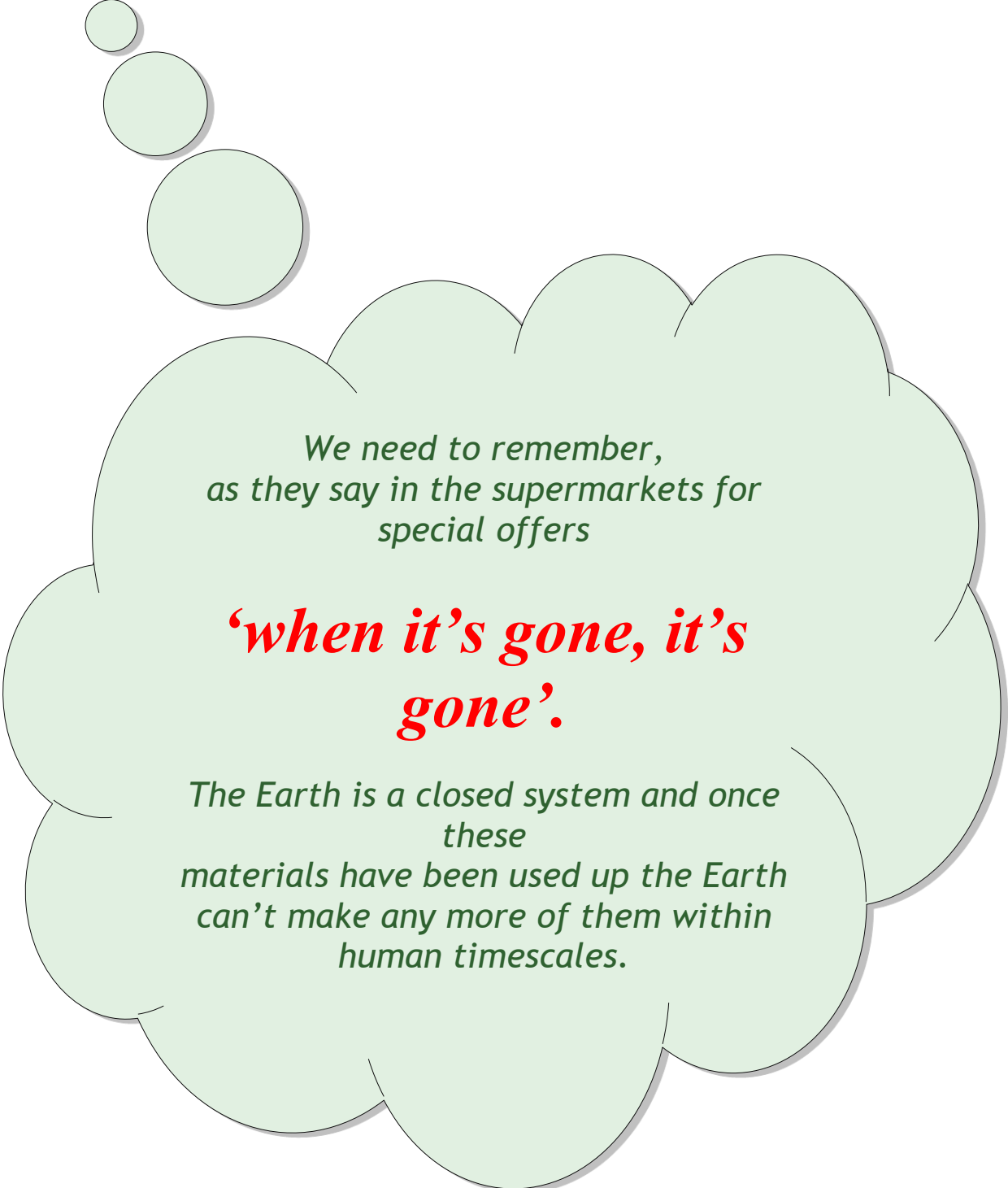
broken items - instead of discarding them and buying new ones .

*(For example, with our clothing, skills such as sewing are not so prevalent nowadays as they were in the past when clothing items would be mended instead of discarded. Also have shoes re-heeled or re-soled where possible instead of throwing them away).*

## REFILL

empty containers .

We need to think for all non-renewable resources such as metals, glass and plastics



*We need to remember,  
as they say in the supermarkets for  
special offers*

***‘when it’s gone, it’s  
gone’.***

*The Earth is a closed system and once  
these  
materials have been used up the Earth  
can’t make any more of them within  
human timescales.*

## 8.1 Waste Generated in the Household or College

Think of the products and materials that are used in an everyday household or college and make a list of the waste you think is generated within a normal week. If possible think of how this waste could be eliminated or reduced, or if this is not possible, how would you dispose of it with as little environmental impact as possible? Some examples are provided in the table below to start you thinking. Use the internet to search for recycling or waste disposal methods, a good site to start with is <http://www.recycleforscotland.com/>

Waste Produced	Method to Eliminate, Reduce or Dispose
<ul style="list-style-type: none"> <li><i>Food waste</i></li> </ul>	<p><i>Only buy what you will use, avoid 2 for 1 offers in the supermarket unless you know you will eat both.</i></p> <p><i>Disposal – compost where possible.</i></p>
<ul style="list-style-type: none"> <li><i>Used batteries</i></li> </ul>	<p><i>Use re-chargeable batteries wherever possible</i></p> <p><i>Disposal – do not put in your household trash, where they can end up in landfill. Contact the council for disposal facilities in your area. If your college does not already do it, consider battery recycling collection points.</i></p>
<ul style="list-style-type: none"> <li><i>Unwanted furniture/household items</i></li> </ul>	<p><i>Consider selling items at a car boot sale or place unwanted items on recycling websites where someone else can then get use of it. Also charity shops will often take large items away for free that they can sell in their shops.</i></p> <p><i>Disposal - contact your council to see if they have any recycling facilities for what you are looking to get rid of.</i></p>
<ul style="list-style-type: none"> <li><i>Paper coffee cups</i></li> </ul>	<p><i>Consider offering cash savings at your college coffee bar for those who use their own reusable mug. Dumfries and Galloway College offer 20 pence off your coffee if you 'lug your own mug'.</i></p> <p><i>Disposal – if you must dispose of paper cups in college ensure you have appropriate recycling methods in place.</i></p>



## 9 WATER USE

Water is essential for all living things on Earth, however it is a resource we take very much for granted in Scotland where we rarely have water shortages. Due to this, we do not always consider water as a finite resource and that not everyone in the world has access to readily available clean water, as we do. In 2007 the average Scottish person used 146 litres of water per day, which is 6% more water per person per day than we used 20 years ago.



### 9.1 Water Conservation

It is difficult to appreciate the need for water conservation when it rains so often in Dumfries and Galloway. However, even in Dumfries we are increasingly experiencing periods with little or no rainfall which means we may soon be facing water shortages. This will become more common in summer months in the future due to climate change. This is already a reality in many places around the world, and as global average temperatures rise, this will only get worse. By 2025, it is estimated that 5.5 billion people around the world, 67% of the population, will live in areas where drought, as a result of climate change, will make water scarce (WWF Scotland, 2006). There are already conflicts over water in some areas of the world, for example in some countries some communities' water supplies are disrupted due to water being required for golf courses for wealthy tourists.

As a result of this we should be conserving water wherever possible. There are a number of easy ways to conserve water around the home and garden. Here are just a few examples:

- Only use your washing machine and dishwasher when they are full.
- Keep a pitcher of water in the fridge for cold drinks instead of running the tap.
- Water your garden in the morning and evening when temperatures are cooler to minimise evaporation.
- Wash fruit and vegetables in a pan of water instead of running the tap and then reuse the water on houseplants.
- Wash dark clothing with cold water on a short cycle which reduces water and energy used and also helps your clothes keep their colour.
- Take showers instead of baths and reduce the time spent in the shower.
- Install a water butt in the garden to collect rainwater for watering the garden.
- Fix any dripping taps.
- Don't wash your car yourself instead use a commercial car wash that recycles water.

Some other changes are not so straightforward and inexpensive to implement; however, they can save money in the long run. Technology can be used for water conservation, for example there are taps available which reduce the amount of water that flows from them and there are washing machines which use a lot less water per load than standard ones. If you need to replace such equipment it may be worth considering alternatives that use less water, especially if this leads to reduced water bills if your water is metered, or reduces business costs.



Image: seaskylab / FreeDigitalPhotos.net

## 9.2 Water Calculator

It is possible to calculate your water footprint, just like earlier in the workbook when you calculated your carbon footprint. Calculate your water footprint at:

[http://news.bbc.co.uk/1/hi/in\\_depth/629/629/5086298.stm](http://news.bbc.co.uk/1/hi/in_depth/629/629/5086298.stm)

**Record here the amount of water you consume**

---

**Q1. Where do you consume the most water?**

**Q2. What changes would you be happy to make to reduce the amount of water you use?**

**Q3. What do you think could make it difficult for you to reduce your water consumption?**

## 9.3 Water Resources and Climate Change

Climate change will affect global water resources. Whilst an increase in global precipitation is expected, the regional patterns of rainfall will vary, meaning some areas will have more rainfall, while others will have less. There are high levels of uncertainty about how the pattern of precipitation will change but areas where agriculture is dependent on seasonal rainfall, like the Indian and West African monsoons, are particularly vulnerable. If monsoon patterns change or the monsoons weaken, millions of people could face food shortages.

Changes in climate and increases in some extreme weather events, such as floods and droughts, will disrupt the stability of the food supply, as well as people's livelihoods, making it more difficult

for them to earn a stable income to purchase food. Some areas may face droughts with changing rainfall patterns, for example, in the Himalayas people are dependent upon seasonal melt water from glaciers which provides drinking water during the dry season. Climate change is causing glaciers to retreat which will endanger their fresh water supply as well as increase flood risks during the rainy season. Other problems associated with decreased water availability and quality in some areas, are increased health and sanitation problems, such as diarrhoeal disease and changes in the patterns of vector-borne disease, which can result in increased levels of malnutrition.

Unfortunately, many of the regions which are likely to be affected are in developing countries where the cost of climate change will be borne most by the poor. People in developing countries are highly dependent on rain fed agriculture for food security so they are particularly vulnerable to changes in annual precipitation levels. Also, because the poor have very limited resources they do not have the ability to adapt to climate change impacts like we can in wealthier industrialised nations.

There are also other indirect impacts of climate change upon water resources. Climate change is not only causing melting ice, but an increase to global temperatures means thermal expansion of the oceans causing sea levels to rise. Rising sea levels leads to salt water intrusion into groundwater supplies, which threatens the quality and quantity of freshwater which will impact large percentages of the population globally.

#### ***Guidance for 9.2 Water Calculator***

*Just like when you calculated your carbon and ecological footprints, the amount of water you consume will be different from what other people consume. Again, this exercise is about raising awareness of water issues, especially when we live in Scotland and don't often have to consider water conservation. However, this is not the case in the whole of the UK; the south of England in particular often has drought worries.*

*This exercise can be used to look at how our attitude towards water is different to the attitudes of those who live in areas of the world that don't have instant clean water on tap. Also consider how our water consumption is much higher than those who place a greater value on their water, especially if they have had to walk miles to collect it. This is also another opportunity to look at the United Nations Millennium Development Goals.*

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## Appendix V - Hairdressing Heroes Workbook



# HAIRDRESSING HEROES: FIGHTING THE CARBON BATTLE

Education for Sustainable Development



## ABOUT THIS WORKBOOK

The author of this workbook is Mrs Elaine Crawford who is the Sustainable Development Adviser at Dumfries and Galloway College. Elaine has a MA in Environmental Sustainability and an MSc in Carbon Management, both from the University of Glasgow. The project to produce this range of workbooks began during a work placement with the Crichton Carbon Centre as part of the MSc in Carbon Management, when the first workbook was produced. As a result of this, a range of workbooks is now being developed to highlight Dumfries and Galloway College's commitment to raising awareness of global issues that will affect us all and to ensure education for sustainable development is fully embedded within all aspects of the curriculum at the college. In places this workbook uses examples that are particular to Dumfries and Galloway College; however, the information it contains can easily be applied to any college.



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# 1 INTRODUCTION

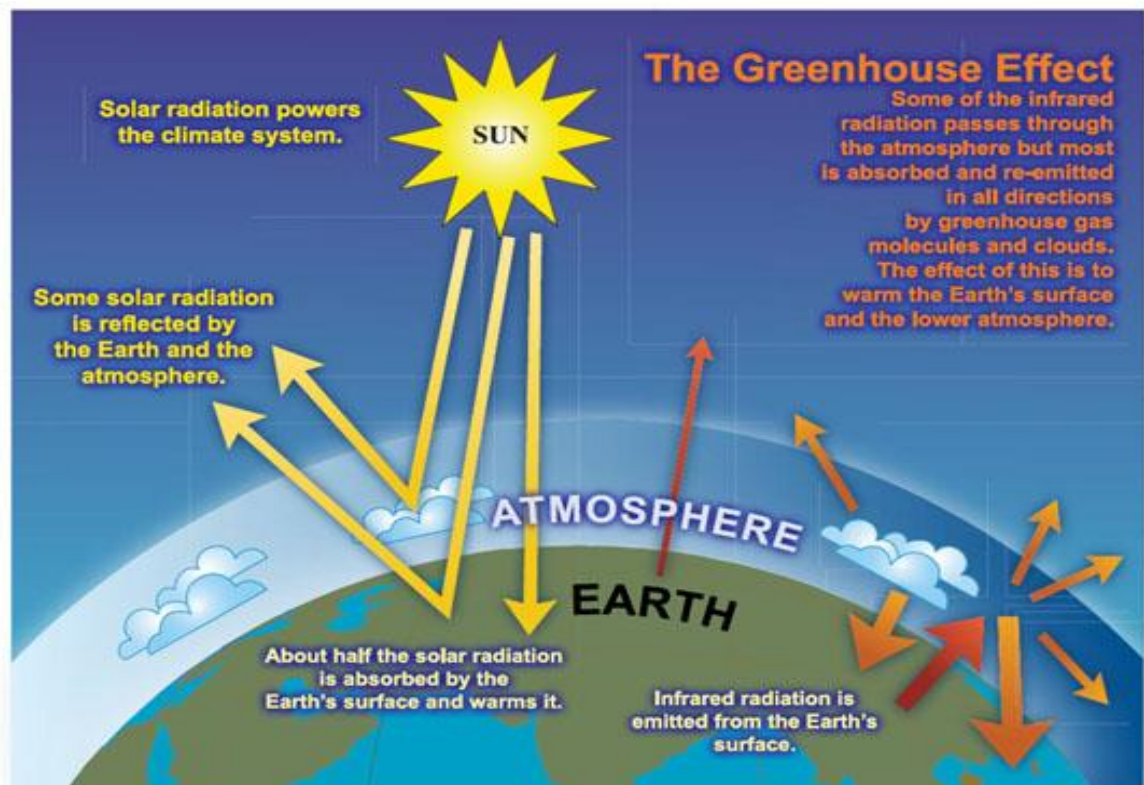
The purpose of this workbook is to introduce the topics of sustainability and sustainable development. There are a number of reasons why sustainability and sustainable development have become increasingly important in recent years, including the issue of climate change caused by human actions. However, sustainability does not mean only looking at climate change and the problems associated with it, but also considers other issues such as population growth, the use of limited resources and social justice. This workbook begins by explaining why we should be concerned about climate change and then moves on to provide information about other areas of our lives we could consider changing in order to live a more sustainable life within the confines of the one planet we call home – the planet Earth.

## 1.1 Climate Change

The Earth's climate has varied naturally throughout its history, with periods when it was much warmer than today and 'ice ages', when Scotland was under glaciers a kilometre deep. However, during these times the Earth was much less densely populated than it is today. As you are probably aware, the Earth is now going through another period of warming, but this is different from those that have happened in the past. Over the last century global temperatures have been rising and scientists have concluded that this recent warming cannot simply be explained as natural variability. Human activities, mainly the emission of greenhouse gases (GHGs), are playing a major part. The main causes are the burning of fossil fuels (such as oil, coal and gas), and changes in land use, such as deforestation. As we increase emissions, the GHGs in the atmosphere also increase. This is resulting in an increase in global average temperatures, average sea level is rising, and snow and ice are melting at an alarming rate (IPCC, 2007). The Intergovernmental Panel on Climate Change has also concluded that most of the warming that has occurred since the mid-20<sup>th</sup> century is very likely due to man-made GHG emissions.

These GHG emissions are 'enhancing' the natural greenhouse effect. The greenhouse effect is a process which keeps the planet warm due to GHGs in the atmosphere trapping radiation from the sun – without it, the Earth would be much colder, around -18°C. The best known GHG is carbon dioxide (CO<sub>2</sub>), but there are a number of others, including methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and water vapour (H<sub>2</sub>O). Put simply, adding GHGs to the atmosphere enhances the greenhouse effect and results in global warming. Diagram 1 – The Greenhouse Effect shows the natural greenhouse effect without man made interference, however the addition of extra GHGs in the atmosphere causes more of the sun's solar radiation to be trapped causing the temperature on earth to increase.

*Diagram 1 - The Greenhouse Effect*



Source: Intergovernmental Panel on Climate Change Assessment Report 4 (2007)

The latest research conducted by experts at the Met Office suggests that if we (and others around the world) continue to operate on a 'business as usual' basis, then we could see an increase in the global average temperature of around 4°C before the end of the 21<sup>st</sup> century. In addition to the changes already mentioned, this increase in global temperature will bring with it major changes to weather patterns and an increasing frequency and intensity of extreme weather events such as hurricanes, heavy rainfall events and heat waves. Such a large and fast change in climate is dangerous and will have severe and costly impacts (Stern, 2007). For example, our ability to produce food around the world will decrease significantly, hundreds of millions of people will face water stress while millions of others will face flooding, and around a third of all species are likely to become extinct (IPCC, 2007).

Scotland, and the rest of the UK, will not be immune from the effects of climate change. Unless we seriously change our lifestyles to cut CO<sub>2</sub> emissions, average temperature increases of up to 3°C in the winter and 4°C in the summer are likely to be experienced by our grandchildren and great-grandchildren (Met Office, 2009). The related weather changes are likely to mean floods, droughts and dangerous heat waves, with a rise in heat-related deaths. In 2003, 37,000 people died as a result of a heat wave in Europe, over 2,000 of which were in the UK (Met Office, 2009). Winters will be significantly wetter, with more intense rainfall. This would mean more flash floods, with rivers bursting their banks more often. Other impacts include an increasing incidence of severe gales and sea level rise, affecting coastal areas causing flooding of coastal homes and businesses, and coastal erosion.

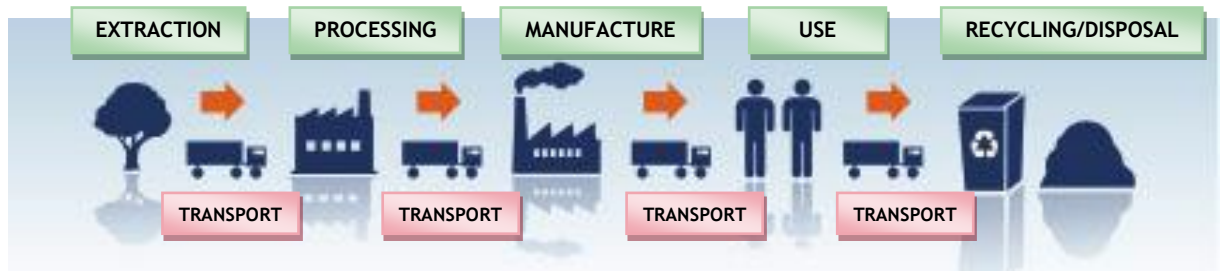
Action now needs to be taken to reduce GHG emissions to ensure that global temperatures do not rise by more than 2°C; this will help to limit the most severe impacts of climate change. This

challenge has been accepted by the UK and Scottish governments with the passing of The Climate Change Act 2008 and The Climate Change (Scotland) Act 2009, both of which set a legally binding target to reduce emissions by 80% from 1990 levels by 2050. In Scotland, the first interim target is a reduction of 42% below 1990 levels by 2020. As a result, we will see increasing regulatory requirements to reduce emissions in both the workplace and the home. Everyone has to play their part in the drive to a more resource efficient, low carbon system if we are to meet these targets and avoid catastrophic interference with the climate system.

Due to the global recession, it is likely that global emissions have fallen due to a reduction in fossil fuel use. The Earth's climate is also going through a natural cooling period, hiding the true extent of climate change for a short period. This may make it seem like we have turned a corner and that the problem has been solved. This will not be the case. Tackling the global climate will be a major project for the whole of humanity and throughout the lives of everyone at the college. We need to do all we can to reduce our GHG emissions by using fewer fossil fuels, more renewable energy and changing our lifestyles to reflect this. Climate change is coming, but with your help, we can reduce its impacts for ourselves and the generations which follow us.

## 2 THE LIFE CYCLE OF EVERYDAY OBJECTS

Life Cycle Analysis (LCA) is a process used to measure the environmental impact of a product or process, from the beginning of its life to the end, or from the 'cradle to grave'. As we can see from the diagram below, to make any product we need to start with the raw materials and then determine how they are processed to make the product, how the product is then used, before it is either discarded or recycled



Source: Adapted from the Swedish Environmental Management Council



Think about what everyday objects are made of, the resources and energy used to make them, how long they can be used for, and what happens to them at the end of their useful life. You may also need to consider the following: -

- Different products and services have their most significant climate impact at different stages in their life cycles.
- For products with a long life and high energy consumption, the **Use Phase** typically accounts for the most significant climate impact, for example a washing machine.
- Other products will have their greatest impact during the **Production Phase** – this is usually the case for food production.
- Some products may not be recyclable and may need to go to landfill.

This is just a small snapshot of the impacts of the life cycle of an object. To see more of the environmental impacts of the products we consume, go to <http://www.storyofstuff.com/> and watch the Story of Stuff.

### 2.1 Activity 1 - The Life Cycle of a Pair of Hairdressing Scissors

Look at the picture of a typical pair of salon style hairdressing scissors. Have a good think about the scissors and answer the following questions. You may find the internet helpful with your answers.



**Q1** What are they made from?

---

**Q2** How are they made? What energy is used to make them?

---



---

**Q3** How do the scissors get to the salon from where they are made?

---



---

**Q4** How long are they used for?

---

**Q5** What happens to paper scissors once their useful life is over?

---

## 3 CARBON FOOTPRINTS

### 3.1 Activity 2 - Your Carbon Footprint

A carbon footprint is the total set of greenhouse gas (GHG) emissions caused by an organisation, event or product (Carbon Trust, 2009). To make it easier to report, it is often expressed in terms of the amount of carbon dioxide (CO<sub>2</sub>), or the amount of carbon dioxide equivalent (CO<sub>2</sub>eq) of any other GHGs emitted, such as methane or nitrous oxide. Activities in our daily lives cause GHG emissions and we can measure the amount to determine our own individual carbon footprint or a product's carbon footprint.

The areas of our lives that generate most of our individual GHG emissions are as a result of:

- Electricity use
- Travel and transport
- Food production
- Buildings we use
- Waste

Carbon footprints are a sub-section of ecological footprints. Ecological footprints look to measure one person's impact upon the world, or the amount of resources or space that are required for an individual to live their life. Go to the following website, <http://footprint.wwf.org.uk/> and enter the data to reflect your lifestyle, it will only take a few minutes to do so. Based on the information you provide regarding the way you live; the calculator will estimate how many planets would be required to support your lifestyle should every person in the world live as you do. This is based on the amount of land required to produce the quantity of resources that you consume.

► Record here how many planets your lifestyle requires \_\_\_\_\_

► Record here your carbon footprint \_\_\_\_\_ tonnes per annum

**You may be surprised by the results!**

**Remember we only have one Earth!**

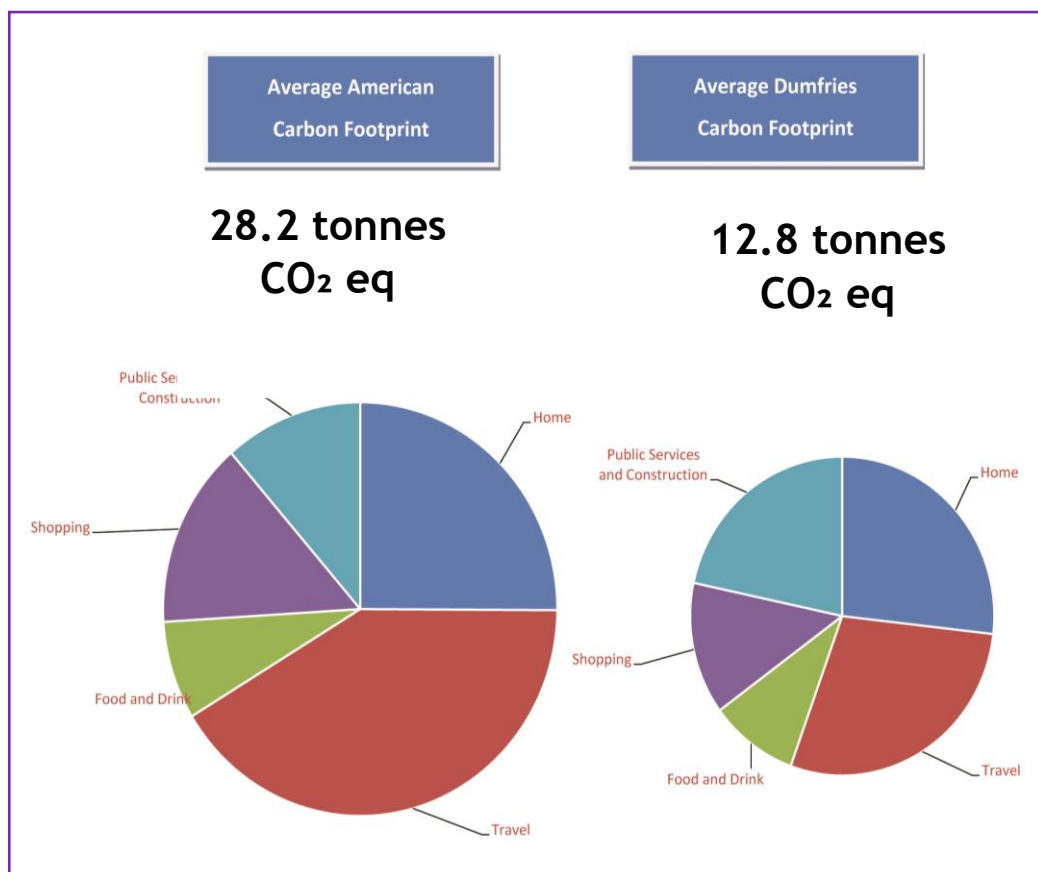
**Available Resource = 1 Planet Only!**



*Image: Salvatore Vuono / FreeDigitalPhotos.net*

### 3.2 Carbon Footprints around the World

Not everyone in the world lives in the same way as many of us in Scotland and other industrialised countries do. Some people are more environmentally aware and try to limit their impact upon the Earth and its resources wherever possible, whilst others don't. Also, not everyone has access to the same amount of the Earth's resources or the means to live as we do in the Western world. The diagram below shows the average carbon footprint of an average North American in tonnes of carbon dioxide equivalent (the total of all their GHG emissions), compared against the average carbon footprint of someone who lives in Dumfries.



*Source: Carbon footprint tool developed by the Crichton Carbon Centre*



In 2009 the average North American had a carbon footprint of just over 28 tonnes of carbon dioxide equivalent and the average carbon footprint in Dumfries was nearly 13 tonnes of carbon dioxide equivalent. Whilst the carbon footprint of the average person in Dumfries is significantly lower than the average North American, we are still not living within the available resources on the Earth if everyone were to have the same share. At the other end of the scale, the average person in China has a carbon footprint of 5 tonnes of carbon dioxide equivalent and in Bangladesh the average is as low as 1 tonne (Clark *et al.*, 2009).

Ecological footprints measure the number of hectares of land that are required to provide all of the goods and services a person consumes. To put this into perspective, the average North American person needs 8 hectares of land to support their lifestyle, the average British person needs 4.9 hectares and the average Indian person only 0.9 hectares (Global Footprint Network, 2010). This highlights the social injustice that exists between different lifestyles around the world. Put simply, if everyone in the world lived like the average American we would need five planets, that's four more in addition to the one we already have!

**Unfortunately, we do not have five Earths!**



*Image: Idea go / FreeDigitalPhotos.net*

## 4 HAIRDRESSING PRODUCTS

In Section 2 we considered the environmental impact of making everyday objects. In your career as a hairdresser, you will need to use different products, all of which have an environmental impact throughout their lifetime. Producers of goods and services are increasingly becoming aware of these impacts and are starting to think of measures they can take to limit the amount of environmental damage their product is responsible for. However, before measures can be taken to reduce a carbon footprint, they need to know how big it is.

Just like people, every good or service can be measured in terms of its carbon footprint. A product's carbon footprint is the total amount of GHGs produced whilst making that product, during its lifetime and then to dispose of it.

To calculate a product footprint there is a '**basket of six**' greenhouse gases that need to be measured, these are: -

- Carbon dioxide (CO<sub>2</sub>)
- Nitrous oxide (N<sub>2</sub>O)
- Methane (CH<sub>4</sub>)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF<sub>6</sub>)

Boots the Chemist, with help from the Carbon Trust, has measured the carbon footprint of their Botanics shampoo range and as a result they determined where they could make reductions in the footprint of the products.

For more information on how the Carbon Trust work with their clients and help them reduce their carbon footprints and the carbon footprints of their products, please look at the link below.

- <http://www.carbontrust.com/our-clients>

It is not just hairdressing products that manufacturers are looking at, below is an example of carbon footprint information for a brand of washing powder.



Image:  
digitalart / FreeDigitalPhotos.net

The carbon footprint of this product is 850g per wash. This can be reduced by washing at a lower temperature. Washing at 30°C instead of 40°C saves 160g CO<sub>2</sub> per wash.

When measuring a carbon footprint, it is important to explain what the amount of carbon measured relates to, or to provide a meaningful unit. In this example the carbon footprint of 850g CO<sub>2</sub> is the amount per washing machine load.



This example refers to the amount of CO<sub>2</sub>, 294g, per bottle of mangoes and passion fruits smoothie.

Image: By permission from Innocent Smoothies

The main benefits of calculating product footprints are to identify both financial and carbon emission savings. Also as customer demand grows for more 'eco-friendly' products it can be used to advertise your green credentials. If customer demand is sufficient this puts pressure on producers and suppliers to think about the environmental impact of their products.

Use the internet to see if you can find more information on the carbon footprint of products. A good place to start is the Carbon Trust website at [www.carbontrust.co.uk](http://www.carbontrust.co.uk) and then search for product footprint information.

### 4.1 Activity 3 - Product Design

Your job is to design and market a hairdressing product aimed at the environmentally aware consumer. This can be any type of product you want such as a hairdryer or a hairdressing product. You will need to decide the type of product and give it a name. You will also need to consider who your market is, for example are you designing a new hairdryer to sell to salons, or a hair gel aimed at the youth market.

How would you design and advertise your product to appeal to your target market? Bear in mind whoever your market is they are environmentally conscious and want a product that has as little impact upon the environment as possible. Your marketing campaign can take a number of different forms as long as the information in the box below is included. Remember, it will need to be colourful and imaginative if it is to appeal to your target audience. A poster or a PowerPoint presentation may be a good way to present your campaign.

*Remember: The Internet is a good resource to utilise for information*

You will need to consider all of the stages in the life cycle of a product which are:

- Extraction of raw materials
- Processing and manufacturing
- Transport and distribution
- Retail and consumer use
- Disposal

Taking account of each of these points, consider how your product could be classed as 'eco-friendly' and how you market it as such.



If you need some inspiration before you start this activity, **The Story of Stuff** website has a good video, '**The Story of Cosmetics**' available at;

- <http://www.storyofstuff.org/movies-all/story-of-cosmetics/>

## 5 CALCULATING ENERGY CONSUMPTION

### 5.1 Electricity - Understanding Watts and Kilowatt Hours

We calculate electricity in units of **kilowatt hours (kWh)**. A kWh is the number of watts used in one hour.

When we look at anything that runs on electricity, such as a hairdryer or a climazone, there is usually a label that tells us how energy hungry it is - this is the number of **watts (W)** the piece of equipment uses – or its 'wattage'. For example, look at the hairdryers in the salons and you will see on the silver label on the handle, the Turbodryer 2000 uses 1400/1500 watts (W).

Before calculating how much energy is used by electrical appliances in our home, we will look at a simple example of electricity consumption using light bulbs in a college classroom.

<b>STAGE 1</b>	<p>If there are 8 light bulbs in a salon and each light bulb is 100W, then to find out the total wattage of the lights you need to multiply the number of bulbs by the wattage:</p> <ul style="list-style-type: none"> <li><b><math>Total\ wattage\ (8\ bulbs) = 8 \times 100\ W = 800\ W</math></b></li> </ul>
<b>STAGE 2</b>	<p>To work out the 'watt hours' (Wh), we need to know the wattage and the number of hours it is turned on for.</p> <ul style="list-style-type: none"> <li><b><math>Watts \times hours = watt\ hours</math></b></li> </ul>
<b>STAGE 3</b>	<p>Then to find out how many kilowatt hours this is, we divide the number of watt hours by 1000:</p> <ul style="list-style-type: none"> <li><b><math>Watt\ hours \div 1000 = kilowatt\ hours</math></b></li> </ul>

For example, if the eight 100 watt bulbs in the salon are turned on for 5 hours, then:

$$\begin{array}{rclclcl}
 800\ watts & \times & 5\ hours & = & 4000\ watt\ hours \\
 4000\ watt\ hours & \div & 1000 & = & 4\ kilowatt\ hours
 \end{array}$$

To calculate how much energy the salon uses for lighting in a year, we need to estimate how many hours the lights are turned on for in a year. To do this we need to estimate the number of hours they are on per day, the number of days they are on per week, and the number of weeks per year.

The salon lights are usually on for 8 hours per day, there are 5 days in the college week, and 40 college weeks per year, so the salon lights are on for:

$$[8 \text{ hours/day} \times 5 \text{ days/week} \times 40 \text{ weeks/year}] = 1600 \text{ hours/year}$$

And the energy they use in a year is:

$$800 \text{ watts} \times 1600 \text{ hours/year} = 1,280,000 \text{ watt hours/year}$$

$$1,280,000 \text{ watt hours/year} \div 1000 = 1280 \text{ kilowatt hours/year (kWh/yr)}$$

Based on an average electricity unit price of £0.10, 1 kWh costs £0.10

$$\text{Therefore } 1280 \text{ kWh/yr costs } 1280 \times £0.10 = £128.00$$

*This means to light the salon during working hours for one year,  
using 8 100 W bulbs costs the salon **£128.00***

## 5.2 Activity 4 - Changing Light Bulbs

The college has low energy fluorescent lighting in the hairdressing salons. Each light fitting contains two 35 W bulbs, and there are 11 fittings in the salon. Prior to moving into the new college building, the salons at the old building used light fittings with 100 W bulbs, with 15 of these bulbs in a salon.

Therefore, how much energy and money did the college save when they moved to the new building by changing the bulbs in the salons?

**HINT:** Estimate how many hours the lights are on each day based on an eight hour day. Remember there are 5 college days in a week, and 40 college weeks in a year, so there are 200 college days in a year.

**REMEMBER:** (watts x hours per year) ÷ 1000 = kilowatt hours per year

	Wattage of 1 bulb [W]	Number of bulbs	Total watts of all bulbs [W]	Hours on per day [hours / day]	Hours on per year [hours / year]	Kilowatt hours of energy per year [kWh / year]
OLD BULBS	100	15	100w x 15 bulbs = 1500 watts	8	8 hours x 200 days = 1600 hours	1500 watts x 1600 hours = 2,400,000 watt hours ÷ 1000 = 2400 kWh / year
NEW BULBS	35	22	35w x 22 bulbs = 770 watts	8		
SAVINGS				SAVINGS		

**Q1** Therefore how many kWh of electricity have been saved in a year in one salon classroom by changing the bulbs?

= \_\_\_\_\_ kWh / year

**REMEMBER:** the average cost of 1 unit of electricity costs the college £0.10

1kWh of electricity costs £ \_\_\_\_\_

Therefore a reduction in use of \_\_\_\_\_ kWh  
saves £ \_\_\_\_\_ a year

**Q2** The new college building has 3 hairdressing salon classrooms, therefore how much electricity and money has the college saved by changing the light bulbs in all 3 salons?

- One salon means a reduction of \_\_\_\_\_ kWh / year,  
so 3 salons means a reduction of \_\_\_\_\_ kWh / year
- One salon saved £ \_\_\_\_\_ a year,  
so 3 salons saves £ \_\_\_\_\_ a year

### 5.3 Activity 5 - Calculating Energy Use from Changing Hairdryers

Over the summer break, due to wear and tear, all of the hairdryers in the salon have been replaced ready for the new academic year. Instead of each hair station having a **Turbodryer 2000** which uses 1500 W of electricity, these have now been replaced by a **Babyliss Eco Dry** energy saving hairdryer which uses 1000 W of electricity. Complete the table below to estimate how much electricity in kilowatt hours (kWh) each salon will save in a year, and then how much will be saved from the electricity bill for the college in a year.

**HINT:** *There are 14 stations in each salon and therefore there are 14 hairdryers being replaced in each salon. If on average each hairdryer is used for 2 hours per day, complete the following table to calculate the electricity used by the hairdryers in one salon in a year.*

**REMEMBER:** *there are 200 college days in a year*

Hairdryer	Wattage of 1 hairdryer [W]	Number of hairdryers in a salon	Total watts of all 14 hairdryers [W]	Hours on per day [hours/day]	Hours on per year [hours/year]	Kilowatt hours of energy per year [kWh/year]
Turbodryer 2000	1500	14	$1500 \times 14$ $=$ $21,000 \text{ W}$	2	$2 \text{ hours}$ $\times$ $200 \text{ days}$ $=$ $400 \text{ hours}$	$21,000 \text{ W}$ $\times$ $400 \text{ hours}$ $=$ $8,400,000 \text{ Wh}$ $\div$ $1000$ $=$ $8400 \text{ kWh / year}$
Babyliss Eco Dry	1000					
Savings				Savings		



Now we know how much electricity the hairdryers in one salon use in a year. We can calculate the amount of electricity used in total by all hairdryers in the college's hairdressing salons.

	kWh/year for 1 salon	kWh/year for 3 salons
• Turbodryer 2000		
• Babyliss Eco Dry		
• Savings		

**HINT:** 1kWh of electricity costs £0.10

- Therefore a reduction in energy use from the 3 salons of \_\_\_\_\_ kWh  
saves £ \_\_\_\_\_ a year

#### 5.4 Activity 6 - Calculating the Electricity Used by Hood Hair Dryers

The hairdressing salons have many different types of hood hair dryers. Calculate the electricity use of each hood hair dryer to see how they compare against each other in terms of energy efficiency.



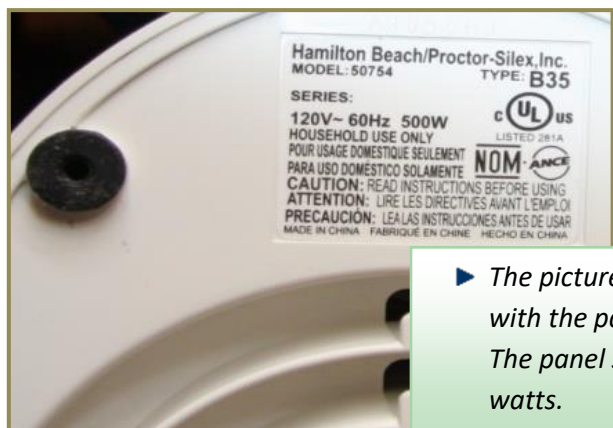
These are some of the hood hair dryers used in the salons.

- Is their performance all similar?
- Do they all take the same amount of time to dry a client's hair?
- Do they all produce the same results?

If so, how much electricity could be saved by only using the most energy efficient model?

**REMEMBER:** There are 40 weeks in a college year and for the purpose of this exercise it has been estimated the hood hair dryer is used for 8 hours per week.

**HINT:** To find the wattage of electrical equipment look for a small information panel on it where you will find the wattage stated.



► The picture to the left shows a household food blender with the panel you are looking for.  
The panel states the wattage of the blender is 500W watts.

Complete the table below to compare the electricity consumption of hood hair dryers. Two examples have already been provided for you. For the remaining spaces, find two different types of hood hairdryer within your salon and find the wattage for them, either on the information panel on the machine or by searching the internet.

	Wattage of hood hair dryer [W]	Average hours used per week [hours/week]	Average hours used per year [hours/year]	Kilowatt hours of energy per year [kWh/year]
• Avant Garde	950	8		
• Wellaportronic	720	8		
		8		
		8		

**Q1** Which hood hair dryer uses the least amount of electricity?

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**Q2** What is the difference in electricity consumption per year of the hood hair dryer that uses the greatest amount of electricity and the hood hair dryer that uses the least amount of electricity?

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**Q3** By only using the hood hair dryers that use the least amount of electricity, how much would this reduce the college's electricity bill by in a year for one hood hairdryer?

- 1kWh of electricity costs £\_\_\_\_\_
- Therefore a reduction in use of \_\_\_\_\_ kWh  
saves £\_\_\_\_\_ a year



## 5.5 Activity 7 - Energy Use of a Climazone versus Cling Film

A climazone reduces the amount of time that colour products need to be left on the client's hair by around 25%. However, if the colour needs to be on the client's hair for 40 minutes, this is only a saving of 10 minutes. If the salon is not particularly busy, the client may not mind sitting a further 10 minutes, particularly if you explain to them why and offer them a coffee and a magazine.

Calculate how much electricity could be saved in one salon if the climazones were not used, either because the client sits a bit longer, or an alternative such as wrapping the head in cling film is used instead.

**HINT:** For this exercise assume the climazones are used for 4 hours per week per salon.  
You will also need to find the wattage of the climazone

**REMEMBER:** there are 40 weeks in a college year

	Wattage [W]	Average hours used per week [hours/week]	Average hours used per year [hours/year]	Kilowatt hours of energy per year [kWh/year]
• Climazone				
• Sitting Extra or Cling Film	0			
• Savings				

**Q1** How much electricity is saved per year in one salon by using cling film, or by the client sitting longer, instead of using the climazone? \_\_\_\_\_ kWh per year

**Q2** If the saving for one salon = \_\_\_\_\_ kWh per year,  
then the savings from 3 salons = \_\_\_\_\_ kWh

**Q3** If the number of hours the climazones were used throughout the year was reduced by half, how much electricity would be saved in one salon?

Climazone use in one salon = \_\_\_\_\_ kWh per year,  
therefore reducing this by half = \_\_\_\_\_ kWh per year

- Q4** By how much would this reduce the college's electricity bill by?  
 1kWh of electricity costs £ \_\_\_\_\_  
 Therefore reducing the use of the climazone in one salon by 50% saves £ \_\_\_\_\_ per year.
- Q5** How much would this monetary saving increase by if the same practice was used in all 3 salons? £ \_\_\_\_\_ per year

## 5.6 Activity 8 - Energy Use at Home

Look around your home and choose five pieces of electrical equipment you can find the wattage easily for. Remember, for many items this can be found on a little panel, failing that you can find the wattage in the manufacturer's guide, if you still have it, or by searching on the internet (a good site is [www.sust-it.net](http://www.sust-it.net)). The items can be anything electrical, for example, a television, kettle, microwave, or something you only use occasionally such as an electric drill or electric lawn mower.

**HINT:** Once you have selected your electrical equipment, make an estimate of how many hours a day on average it is switched on and then complete the following table. The first line has been completed as an example.

**REMEMBER:** there are 365 days in a year

Type of equipment	Make and model	Wattage [W]	Hours of use per day [hours / day]	Hours of use per year [hours / year]	Kilowatt hours of energy per year [kWh/year]
TELEVISION	Sony KDL 32EX603 32"	80	4	$4 \times 365$ $=$ 1460 hours / year	$80\text{W} \times 1460 \text{ hours}$ $= 116800 \text{ Wh}$ $\div 1000$ $= 116.8 \text{ kWh/year}$

**Q1** What is the most energy intensive piece of equipment you found?  
Remember this is the piece of equipment with the highest wattage.

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**Q2** Which piece of equipment consumes the most electricity per year?

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**Q3** Were you surprised by any particular result?  
If so, what is the piece of equipment and why were you surprised?

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**Q4** Can you think of an example of an electrical item that you could substitute manpower for  
and still achieve the same result?

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**Q5** What room in your house do you think is the most energy intensive in terms of electricity?  
Why do you think this is?

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**Q6** Take the piece of equipment with the highest electricity consumption and search the  
internet for a less energy intensive alternative. What did you find?

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**Q7** Electricity aside, can you think of any other ways energy is consumed in your household?

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## 6 WATER USE

### 6.1 Water Conservation

Water is essential for all living things on Earth, however it is a resource we take very much for granted in Scotland where we rarely have water shortages. Due to this, we do not always consider water as a finite resource and that not everyone in the world has access to readily available clean water, as we do. In 2007 the average Scottish person used 146 litres of water per day, which is 6% more water per person per day than we used 20 years ago.



Image: Ideago / Free Digital Photos.net

It is difficult to appreciate the need for water conservation when it rains so often in Dumfries and Galloway. However, even in Dumfries we are increasingly experiencing periods of little or no rainfall, which means we may soon be facing water shortages, and this will become more common in summer months in the future due to climate change. This is already a reality in many places around the world, and as global average temperatures rise, this will only get worse. By 2025, it is estimated that 5.5 billion people around the world, 67% of the population, will live in areas where drought, as a result of climate change, will make water scarce (WWF Scotland, 2006). There are already conflicts over water in some areas of the world, for example in some countries communities' water supplies are disrupted due to water being required for golf courses for wealthy tourists.

As a result, we should be conserving water wherever possible.

Hairdressing is a water intensive industry for a number of reasons such as:

- Shampooing client's hair
- Cotton used for towels as growing cotton is water intensive
- The quantity of towels used generates a lot of washing.
- Water requirement in the production of hairdressing products.



Image:  
graur razvan ionut /  
FreeDigitalPhotos.net

In order to conserve water, we need to think how hairdressing practices in the salon could change to be less water intensive. The first step could be not to waste water wherever possible, which could mean only having the tap running when it is needed. This means when washing a client's hair, the tap should be switched off when the water is not being used to rinse products from the hair. This may seem obvious, however it is simple to implement and could mean a large reduction in water usage. Another simple measure is to ensure the washing machine always has a full load before switching it on. This may not be an issue in the college where there are always lots of towels to wash, but this may not be the case if you work in a small salon. This is also a simple measure to put into practice at home.

Some other changes are not so straightforward, such as technology being used for water conservation. There are taps available which reduce the amount of water that flows from them and there are washing machines which use a lot less water per load than standard ones. If you

need to replace such equipment it may be worth considering alternatives that use less water, especially if this can lead to reduced water bills which could save your employer money.

## 6.2 Activity 9 - Water Conservation Calculations

Standard taps use around 15 litres of water per minute. There are taps available that can reduce this to 3 litres per minute. If we assumed the taps in the salon were using 15 litres per minute, how much water could be saved if they were changed to those that use 3 litres per minute?



**HINT:** There are 4 sinks in each salon and there are 3 salons

	Tap flow per minute for 1 tap [litres / minute]	Tap flow per minute for 4 taps [litres / minute]	Tap flow per minute for 3 salons [litres / minute]
Standard Tap	15 litres		
Low Flow Tap	3 litres		
Savings			

**Q1** In total, how many litres of water per minute would be saved if the taps were changed in all 3 salons? \_\_\_\_\_ litres / minute

Next, let's look at how much water actually flows from the taps in the salons. This way we can calculate how much water is saved by not leaving the tap running when shampooing a client's hair. To do this we will need a **bucket** and a **measuring jug** to measure the water flow from the tap.

- Tap flow in 10 seconds = \_\_\_\_\_ litres

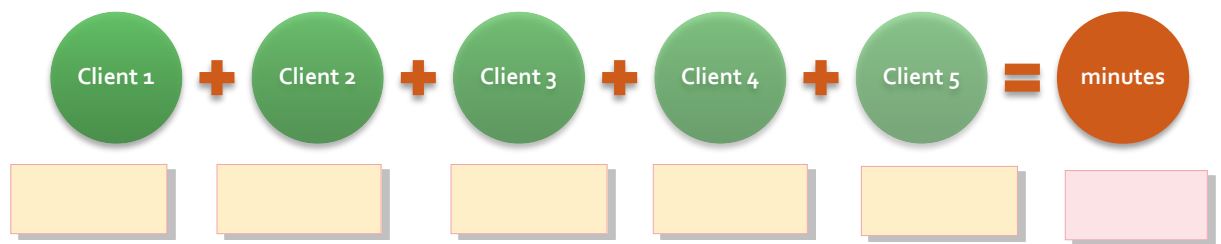
Therefore, tap flow for 1 minute = \_\_\_\_\_ litres x 6 = \_\_\_\_\_ litres

Next we need to estimate how long the taps are running each day. For the next 5 client's hair you shampoo, record how long the tap is on from start to finish. A stopwatch will be required.

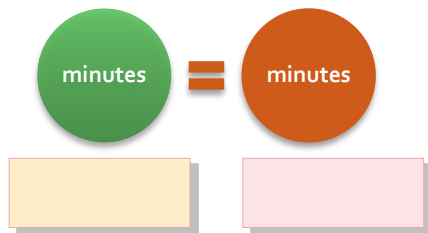
CLIENT	Client 1	Client 2	Client 3	Client 4	Client 5
Time in minutes					

To calculate the average time it takes to wash a client's hair, add the time in minutes together of the 5 clients and divide by 5.

#### STEP 1



#### STEP 2 (divide the total number of minutes by five to get the average time)



Now that we know the tap flow per minute of the salon taps and the average time it takes to wash a client's hair, complete the following table to calculate the amount of water that could be saved per salon if the taps were changed to low flow water efficient ones.

**HINT:** For the purpose of this exercise we will assume each student washes 2 heads per day which adds up to 140 washes per salon per week.

	Tap flow per minute [litres / minute]	Average time per client [minutes]	Litres of water used per client [litres / client]	Number of clients per week [clients / week]	Water use in one salon per week [litres / week]
Salon Tap					
Low Flow Tap	3				
				Savings	



**Q1** How much water is used in one salon per week to wash 140 heads?

----- litres/week

**Q2** How much water would be saved in one salon per week by changing to low flow taps?

----- litres/week

**Q3** How much would be saved in three salons per week by changing to low flow taps?

----- litres/week

**Q4** Based on a 40 week college year, how much water would be saved in a year by changing the taps in all 3 salons?

----- litres/ year

**Q5** If the college pays an average amount of £0.08 per litre.

Based on changing the taps in the 3 salons, how much money could the college save per year?

----- litres/ year x £ \_\_\_\_\_ = £ \_\_\_\_\_

### 6.3 Activity 10 - Poster Competition

Design a poster to be displayed either beside the washing machine or beside the salon sinks stating all of the important points to consider in this area for water conservation.

The poster needs to be colourful and eye-catching whilst clearly stating what is required and why.

The winning design will be made into a poster and displayed in the appropriate area within the college.

## 7

## WASTE



There is a limit to the amount of waste the Earth can absorb. When we look at a product and the waste it generates, we need to look at it from the 'cradle to grave'. This is why we have looked at products so far starting with the raw materials they are made from and ending with the disposal of the item. In order to reduce the amount of waste we produce, we need to reduce the number of products we consume. We have more money to buy more 'stuff' and as we like new 'stuff' we are always buying more. Also, products are not made to last like they were in the past. Our grandparents would 'make do and mend' whilst we just throwaway and replace. Economies of countries are driven by producing and selling more materials, so to make products that last longer does not make economic sense. (If you have not already done so, now is a good time to watch 'The Story of Stuff' at <http://www.storyofstuff.org/movies-all/story-of-stuff/>).

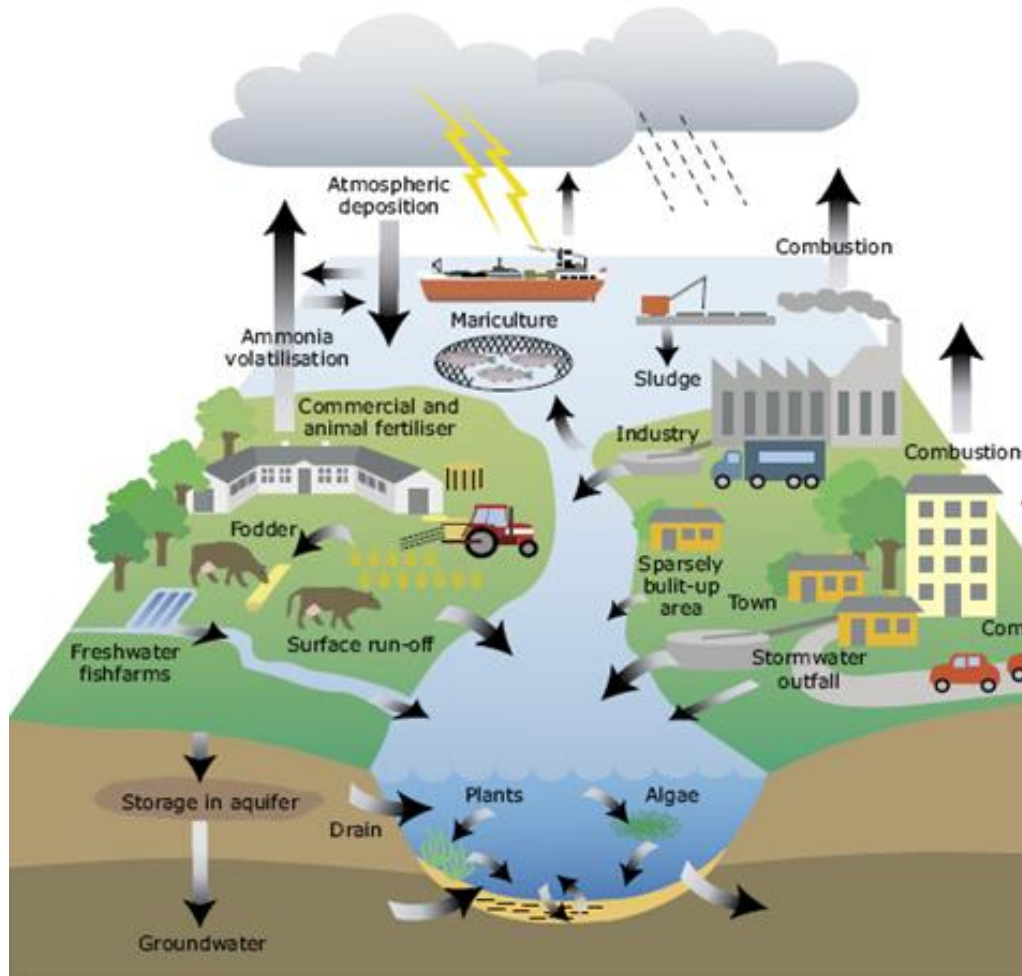
Packaging is a major source of waste. The minute we remove it from a product waste is produced. One way to reduce the amount of packaging is by consumers putting pressure on suppliers to not over package their goods. This may be difficult for an individual, however if you are responsible for purchasing hairdressing products on a large scale for an employer or your own business, this may then become possible. It is also worth investigating if a supplier has an environmental policy and, if so, what it consists of, before deciding to use that supplier. As was established in the section on the life cycle analysis of a product, we should consider waste impacts from 'cradle to grave' for a product. If we produce and use less packaging, this means there are less raw materials required to make the packaging and less energy being used also. Less packaging also means less waste to recycle, which also uses energy, or less waste sent to landfill.

The waste produced in the salons is not only a concern due to the disposal of packaging but also due to disposal of the chemicals used in the products. Chemical waste causes pollution, which can be either point source or non-point source. Point source pollution is usually defined as pollution where the origin can be defined from one source, such as at the end of a pipe. Non-point source pollution is caused indirectly by chemicals leaking into groundwater. If disposed of incorrectly, the chemicals used in the salon can cause pollution to our environment by leaching into our groundwater from landfill sites. This can have a negative long-term effect on human health and also impacts upon plants and animals.

*Here is an example of **point source pollution** or **end of pipe pollution**. It is generally easy to see and recognise point source pollution, which can make it easier to address.*



Image: dan / FreeDigitalPhotos.net



Source: <http://www.eea.europa.eu/themes/water/water-pollution>

**Non-point source pollution** can be more difficult to identify as it can originate from many sources.

In the picture above chemicals are leaching into groundwater from many different sources including farming, industry and towns.

### 7.1 Activity 11 - Waste Generated in the Salon

Think of the products and materials that are used in the salon and make a list of the waste you think is generated within a normal week. If possible, think of how this waste could be eliminated or reduced.

**HINT:** *include waste that could be generated as a result of lectures as well as hairdressing procedures and also think of canteen waste, i.e., tea and coffee for clients*

Waste Produced	Method to Eliminate, Reduce or Dispose
•	
•	
•	
•	
•	
•	

Attitudes towards waste in our society are slowly changing. The best way to minimise the amount of waste we produce is to reduce the amount of 'stuff' we use. Failing this the next best option is to re-use wherever possible.

Most of you will probably be familiar with the concept of '**Reduce, Reuse, Recycle**' already:

**REDUCE**

the amount of waste we produce

*(For example by manufacturers using less packaging on products or by consumers buying re-fill packs which use less packaging. Consumers can also put pressure on manufacturers and retailers to use less packaging.)*

**RE-USE**

packaging or waste wherever possible, either for the same purpose or find a new use for it

*(For example, save last year's Christmas cards and wrapping paper. Wrapping paper can be used again and Christmas cards can be cut up and used as name tags or decorations. Old magazines and newspapers can be used as wrapping paper with some pretty ribbon or bows added)*

**RECYCLE**

break your waste down and reprocess it, however remember this uses further energy.

*(However, remember this uses further energy and some items cannot be recycled because of toxic chemicals in them or because they may have been manufactured from different materials squashed together).*

***So most of us are familiar with the message REDUCE, RE-USE, RECYCLE. However, this can also be added to.***

**REPAIR**

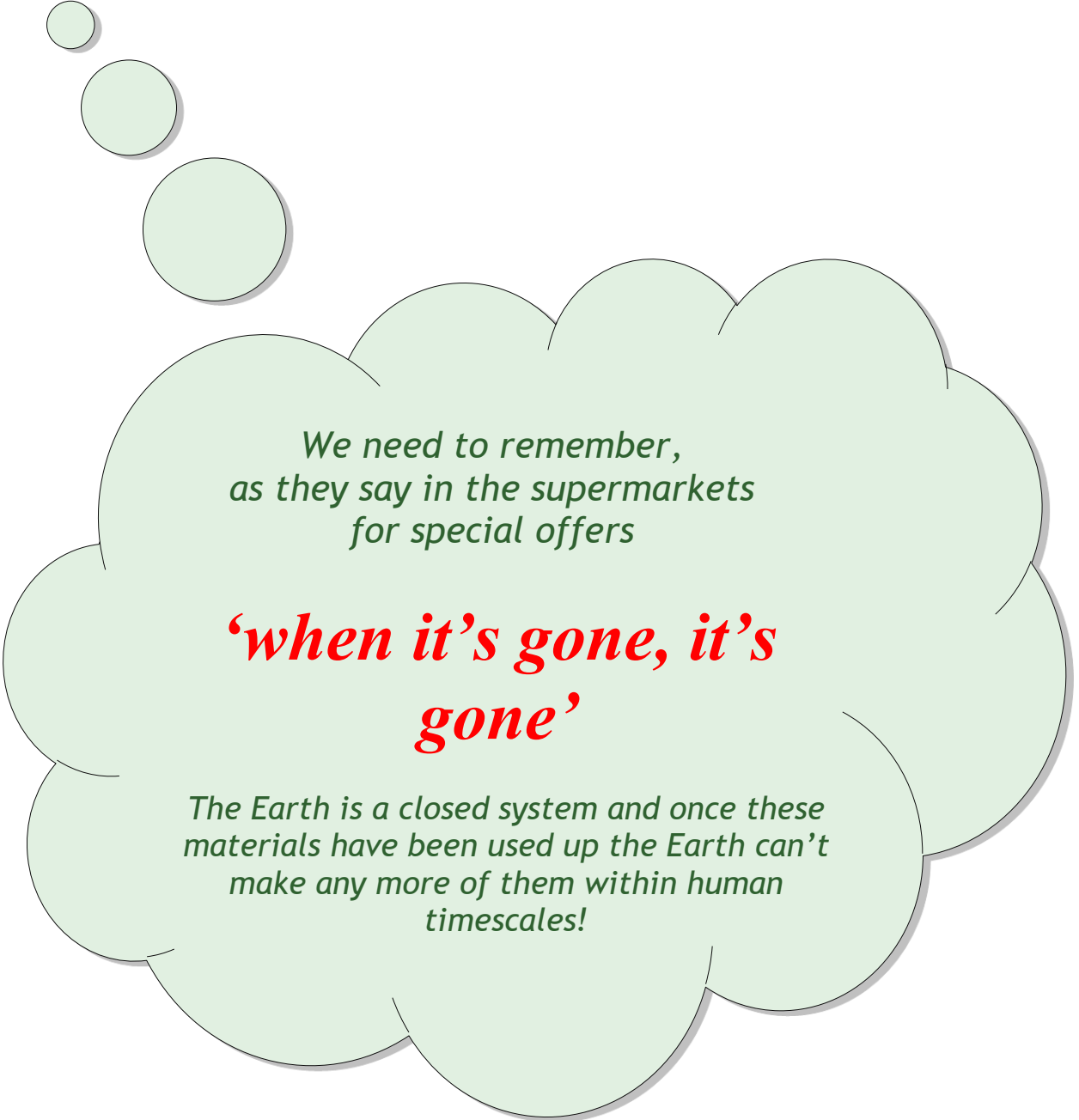
broken items - instead of discarding them and buying new ones .

*(For example, with our clothing, skills such as sewing are not so prevalent nowadays as they were in the past when clothing items would be mended instead of discarded. Also have shoes re-heeled or re-soled where possible instead of throwing them away).*

**REFILL**

empty containers .

*We need to think for all non-renewable resources such as metals, glass and plastics*



*We need to remember,  
as they say in the supermarkets  
for special offers*

***‘when it’s gone, it’s  
gone’***

*The Earth is a closed system and once these  
materials have been used up the Earth can’t  
make any more of them within human  
timescales!*

## 8 BUILDINGS

### *Sydney at Night*

Around half of all global GHG emissions are generated as a result of buildings. During the useful life of a building, this includes emissions during construction, the electricity we consume within them and the energy required heating them. Once we are finished with the building there are emissions associated with its demolition, with materials either recycled, which uses energy, or sent to landfill, which has other environmental impacts also. As we have seen earlier this is emissions from the 'cradle to the grave' of the building. There is huge potential for energy reduction in buildings as they are responsible for 40% of energy consumption and 36% of European Union CO<sub>2</sub> emissions (European Commission, 2010).



*Image savit keawtavee / FreeDigitalPhotos.net*

Dumfries and Galloway College building is new and has been designed and built to be energy efficient. However, this does not mean that improvements in energy reduction cannot be made because a building can be as energy efficient as possible, but if it is not used correctly then it will not be effective. This is why it is important not just to use the most energy efficient type of



electrical equipment available, but also to ensure it is not left switched on unnecessarily.

In a building such as a college, equipment like computers and printers are often left on standby consuming energy and costing money which could be easily saved. A simple

measure such as placing stickers beside equipment reminding staff and students to switch off once finished with could help reduce this.

When you leave college and enter into employment there are simple and inexpensive measures concerning the salon building you could suggest to your employer such as:

- Replacing light bulbs with lower wattage versions where possible.
- Draught proofing doors and windows.
- Placing special foil panels behind radiators to reflect more heat into the room.
- Redecorating with insulating paint.

There are other measures which require more time, effort and money such as:

- Replacing doors and windows with double or triple glazing.
- Ensuring there is adequate wall and roof insulation.
- Changing the boiler and heating system.
- Switching electricity suppliers to one that utilises renewable energy sources to generate electricity.

These measures can also be implemented within your home. Inexpensive measures such as using draught excluders along the bottom of doors and fitting heavy lined curtains in front of draughty windows, especially in the winter, are easy to do. It is also easy to turn appliances off at the wall when not in use ensuring they are not accidentally left on standby. Whilst some of the other measures are more expensive, there may be instances where grants are available to help with the costs of procedures such as cavity wall and roof insulation.

Check the Government's Grant website at <http://www.government-grants.co.uk>



*Blacklaw Wind Farm, Lanark, Scotland - Image by: Author*



## 9 TRAVEL AND TRANSPORT

Transport and travel make up a large part of our carbon footprints. Much of this can be attributed to the use of the motor car as this has become the most popular and convenient way for many of us to travel.

The car is often seen as a '**status symbol**' and for many 17 year olds, obtaining a driving licence and owning a car is considered a natural part of becoming an adult.

Different forms of transport are responsible for varying levels of GHG emissions, starting with walking or cycling which do not generate any, to air travel which generates more emissions than any other form of transport. In terms of our everyday lives, we can choose whether to use public transport, instead of sitting on our own in a car, or decide not to fly on holiday but stay in the UK instead. However, sometimes it is difficult or inconvenient for us to make changes, especially if running a business, such as a hairdressing salon where you need to encourage people to travel to your salon.

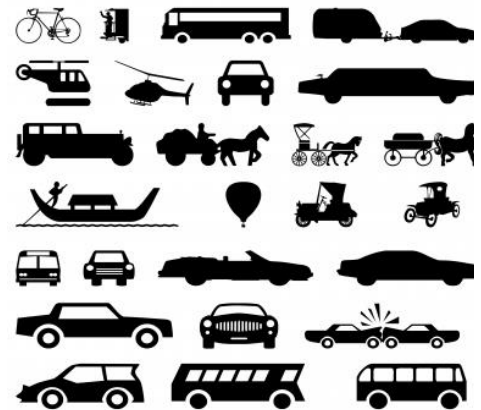


Image: xedos4 / FreeDigitalPhotos.net

### 9.1 Activity 12 - Changes to my Travel

Think of your lifestyle and complete the following table advising where you could make changes to reduce the GHGs you generate from travel. Also think about the barriers which may make it difficult for you to implement these changes, for example, I will use my car less and take public transport to college; however, the bus times may not get you to college in time.

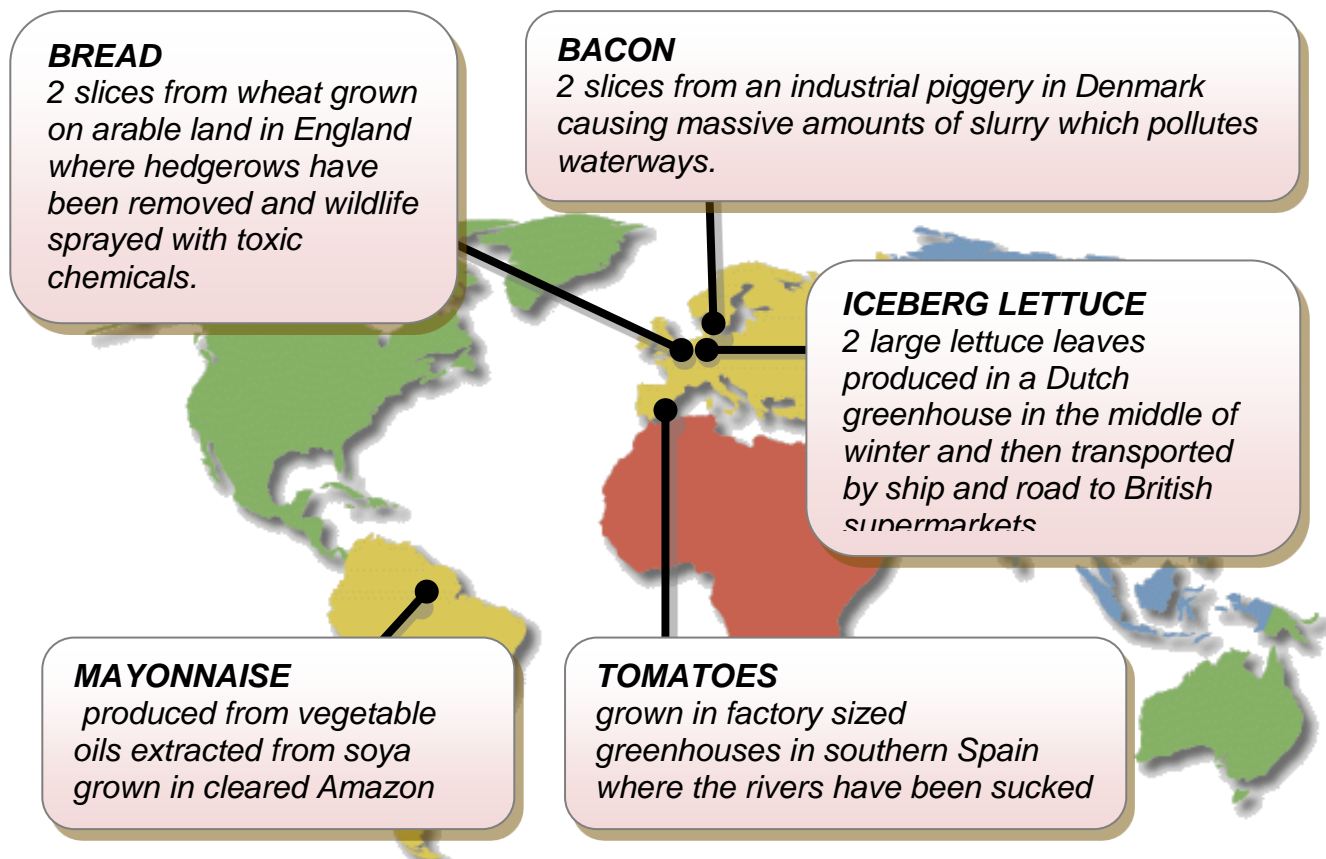


## 10 FOOD

It should already be evident to you from calculating your carbon footprint that one of the major contributors to our ecological and carbon footprint is the food we consume, but why is this? The easiest way to explain it is to look at an example of an everyday snack or lunch we may enjoy.



Taking a bacon, lettuce and tomato sandwich as an example, where do all of the ingredients come from?



Source: Adapted from the Teachers pack *School Global Footprints* (WWF Scotland, 2006). Image: piyato / FreeDigitalPhotos.net

We can see from the example above, just how far our food often travels before it ends up on our plate. Therefore, it should be evident that if we were to consume less food grown in other countries and transported to the UK, and eat more food produced in the UK, this would reduce our carbon footprint in relation to our food consumption. However, it is not always this straightforward. What would we do if we wanted fresh strawberries in January or pineapple at any time? Should we only eat seasonal fruit and vegetables that can be grown in the UK without the need for energy intensive hot houses?

## 10.1 Environmental Impact of Food

As we have seen, everything we eat has an impact upon the environment however there are steps we can take to help reduce the environmental impact of food, including the following:

- Shop locally and if possible, leave the car at home.
- Plan one big trip if using a large supermarket instead of going two or more times per week.
- Buy locally grown produce when it is in season.
- Avoid food which is over packaged whenever possible.
- Buy organic produce.
- Buy fair-trade goods which support third world communities and are usually transported by sea.

## 10.2 Fair Trade

Fair Trade has gained in popularity over recent years in our shops and supermarkets, especially with items such as tea, coffee, cocoa, chocolate and bananas. The purpose of Fair Trade is to provide justice and equality for small independent producers and the workers on plantations. The plantations are located in developing countries where workers are often exploited. In the past many of these farmers and workers were paid low wages and forced to work in poor conditions meaning they had to live in poverty. All of this meant they had little opportunity to improve their situation. Fair Trade aims to reverse this trend by ensuring there are standards in place for working conditions, and by implementing prices for traders and consumers. This means the farmers and workers are paid a fair wage. Fair Trade also ensures that the welfare conditions for the workers are acceptable, that children are not employed who should be in school and that farming practices are sustainable.

When we think of Fair Trade products, some of the first things that spring to mind include tea and coffee, or chocolate and bananas, none of which grow in the UK. Therefore, sometimes we need to think about compromising one belief or value we have, to support another. In this case the carbon emissions to transport these goods around the world, versus the need to help communities in developing countries support themselves and receive a fair income.

It is customary to offer your client's a cup of tea or coffee whilst they are in the salon, so if you are going to buy these products anyway then this may be an area where you wish to consider using Fair Trade products.

### 10.3 Activity 13 - Environmental Impacts of Food Production

Decide what your favourite meal is, whether this is a burger, a curry, or fish and chips. Think about what the environmental impacts could be of producing that meal. Use the internet to search for the effects that producing the individual ingredients in your meal has upon the environment. Think about where and how the ingredients are grown and how they reach the supplier you have purchased them from.

My favourite meal is:

---

The ingredients include:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

Record here what you think some of the environmental impacts of your meal could be:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

## 11 MANAGING A SMALL HAIRDRESSING SALON

*You are the manager of a small independent hair salon.*



The salon includes:

- a reception area
- 4 hairdressing stations
- 2 hair washing basins

The salon employs:

- you, as the manager and senior stylist
- two further stylists
- a hairdressing trainee
- a receptionist
- a salon junior for late night openings and Saturdays

Salon equipment consists of:

- 4 x Parlux 3000 hairdryer
- 4 x GHD hair straighteners
- 4 x Hairtools hair tongs
- 2 x Wella Climazone
- 1 x Avante Garde hood hairdryer
- 1 x Wellaportronic hood hairdryer

Equipment (Make and Model)	Wattage [W]
• Parlux 3000 hairdryer	1810
• GHD hair straighteners	120
• Hairtools hair tongs	15
• Avante Garde by REM hood hairdryer	950
• Wellaportronic hood hairdryer	720

Procedure	Number per week	Average time taken [minutes]	Average water consumption [litres]
• Cut and blow dry	25	90	60
• Colour	15	180	90
• Perm	12	150	90

### 11.1 Activity 14 – Environmental Impacts of a Small Hairdressing Salon

#### Energy Calculations

- Based on the information provided above, complete the following calculations.

#### Example 1

A cut and blow dry on average takes 30 minutes. If a third of this time is spent drying the hair, how much electricity is used each year on cut and blow dries?

$$\begin{aligned}
 & 30 \text{ minutes} \times 25 \text{ clients} &= & 750 \text{ minutes/week} \\
 &= 750 \div 60 &= & 12.5 \text{ hours/week} \\
 &= 12.5 \times 52 \text{ weeks/year} &= & 650 \text{ hours/year} \\
 &= 650 \text{ hours} \times 1810 \text{ W} &= & 1,176,500 \text{ Wh/year} \quad \div 1000 \\
 &= 1176.5 \text{ kWh/year}
 \end{aligned}$$

- Q1** Following this example, if the Parlux 3000 hairdryer (1810 W) was changed to a BarBar ECO-8000 hair dryer (1000 W), how much electricity would be saved?

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*Fifteen customers a week have their hair permed. Each customer on average sits under a hood hairdryer for 20 minutes.*

- Q2** Calculate the amount of electricity that would be saved in a week if the Wellaportronic hood hairdryer (720 watts) was used for each customer instead of the Avante Garde by REM hood hairdryer (950 watts).

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- Q3** How much electricity would be saved in a year if the salon then removed the Avante Garde by REM hood hairdryer altogether? **REMEMBER:** There are 52 weeks in a year.

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### Water Calculations

Getting a perm or a colour is extremely water intensive due to the chemicals having to be completely rinsed out of the hair. On average, during hair colouring customers have their hair rinsed for 5 minutes using a tap with a water flow of 10 litres per minute.

- Q4** Calculate how many litres of water would be saved weekly by switching to low flow taps of 5 litres per minute for customers getting their hair coloured.

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- Q5** If all customers receiving a perm or a colour have their hair rinsed for 5 minutes, how many litres of water would be saved in a year by switching to the low flow taps?

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Based on the information provided, and taking into account the knowledge you have of hairdressing practices, can you think of how energy savings could be made in the following areas?

Recommendations to **reduce ELECTRICITY USE**:

- ---
- ---
- ---

Recommendations to **reduce WATER CONSUMPTION**:

- ---
- ---
- ---



Recommendations to **reduce FUEL CONSUMPTION** from travel (staff and customers):

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

Any other recommendations to **reduce** the overall salon **CARBON AND ECOLOGICAL FOOTPRINT**:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

## 12 AND FINALLY .....

The last activity is to consolidate all of the information contained within the workbook. You can use the information you have learnt from any section of the workbook provided it relates to what is being done in your curriculum area to tackle sustainability issues.

### 12.1 Activity 15 - Poster Competition

Design a poster to advertise what is happening in the Hairdressing area of the college to promote sustainability. The project can be related to any aspect of your college life, whether this is a class project, a Citizenship project or a cross college project your class is engaged in. The winning designs will be made into artwork and displayed around the college. The poster below may give you an idea of what is required. This poster was designed in Dumfries and Galloway College and used as part of a campaign to promote the use of reusable mugs. Using reusable mugs instead of paper cups stops paper cups ending up in landfill sites, and saves the resources that were required to make them in the first place, such as wood and water.

To give you some ideas, here are some topics your poster could be about:

- ▶ RECYCLING
- ▶ PRODUCT USE
- ▶ WATER CONSERVATION
- ▶ ENERGY CONSERVATION



## WOULD YOU LIKE TO SAVE 20P EVERY TIME YOU BUY A HOT DRINK



REUSABLE  
TRAVEL  
MUGS  
ON  
SALE  
FOR  
£2.99

Save 20p of the cost  
of your hot drink at  
Costa Coffee by  
using your own  
reusable mug

*(10p in the canteen)*

Save Paper Cups being sent to landfill and  
the trees and water needed to make the  
paper cups.

Save energy and stop harmful greenhouse  
gas emissions going into the atmosphere.



'Save your pennies,  
save the world'

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